EXPERT ADVICE • BEST BUYS • TOP TIPS • HOT NEWS

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AMIGA SHOPPER

From the makers of AMIGA FORMAT

SNEAK PREVIEW • APRIL 1991 • FREE WITH AMIGA FORMAT

HARDWARE

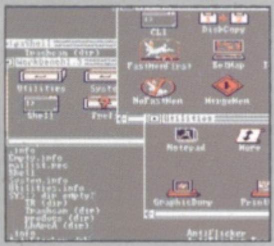


Your complete and exhaustive guide to floppy disk drives – the first of many indispensable buyers' guides is on... **page 10**

PROGRAMMING

Our team of expert programmers guide you through the complexities of assembly language, Basic and C........... **page 32**

PUBLIC DOMAIN



Your guide to free software provides the most detailed coverage yet of the massive Public Domain scene..**page 33**

PUBLISHING

We don't just tell you what's the best software and hardware to buy, we even show you how to use it........... **page 19**

AMOS

Monthly tutorials to help you get the most out of the software that has taken the programming world by storm... **page 26**

AMIGA ANSWERS

Whatever your problem with the Amiga we will help. Get in touch with our panel of experts.............. page 8



GET SERIOUS ABOUT YOUR AMIGA

News, reviews, tips, tutorials and advice – simply unmissable!

COMING IN ISSUE 1: HARD DISKS • GRAPHICS • MUSIC • COMMS • VIDEO • ON SALE: APRIL 4

NO GAMES - GUARANTEED!

NEW • NEW • NEW • NEW • NEW • NEW FROM FUTURE PUBLISHING • NEW • NEW • NEW • NEW • NEW

WELCOME TO AMIGA SHOPPER



Welcome to the only monthly magazine totally dedicated to the serious side of the Amiga. This special issue is a sneak preview of the fact-packed, hard hitting, value-for-money magazine that will appear at a newsagent near you every month from April 4. We can only give you a taste of the wealth of news, reviews, tips and guides that await you, but our exhaustive test of floppy drives should whet your appetite for the joys to come. Just imagine, over 75,000 words and at least 116 pages every month for just 99p!

The floppy-drive test is an example of the comprehensive and ruthless buyers' guides we will be conducting every month, covering hardware and software, to identify the best buys for you. The rest of this special issue gives you a taste of the monthly columns we willl be featuring. They will be joined in issue one by columns on video, comms, music, hardware projects and much more.

We can bring you this unrivalled store of Amiga information because we've assembled the most experienced magazine team of Amiga experts ever. Consultant editors Jeff Walker, Mark Smiddy and Phil South are three of the most respected Amiga journalists, now forming an unbeatable team that will give you the most authoritative reviews and helpful tutorials available.

Amiga Shopper is packed with useful editorial. We've stripped out the expensive production costs so we can cram in as much valuable information as possible. There are no expensive colour games pages because there are no games pages at all!

My name is Bob Wade, I'm the Editor and, having spent 18 months editing our sister magazine *Amiga Format*, I'm confident we can give you the serious Amiga magazine you've been asking for. Why don't you write to me and tell me what you want from *Amiga Shopper*? If you want to be where the news happens first, the reviews are exhaustive, the help unlimited and the bargains the best – then be here!

Bob Wade

COMING IN ISSUE ONE - ON SALE APRIL 4

Hard drives on test
We will be putting all the hard disk drives through their paces and recommending the best buys. If you're planning to buy a hard drive, this is the only guide you will need.

REGULARS
In addition to the columns in this special issue, we will have monthly columns on all the following subjects:

Comms
Keep yourself in touch with the world of modems and find out who is worth calling.

Education
Not only reviews, but loads of useful advice on how best to educate with your Amiga.

User groups
Get active and involved with other users of the world's best and most versatile computer.

Music
We will show you how to make beautiful noise and what gear to make it with.

Video
Find out how the Amiga is taking the video production world by storm – and how you can be a part of this exciting revolution.

SPECIALS
We will also be running regular features on these fascinating areas of the Amiga world:

Shows
We will tell you which shows are on, what will be there and then whether it was worth going.

Hardware projects
Make your very own handy hardware add-ons with the help of our special projects features.

Books
Find the books that really deliver the hard info and avoid those that are just plain doorstops.

CDTV
Is CD software going to take the Amiga by storm or will it be a white elephant? We will be reporting on all the new developments.

WHAT'S IN STORE

AMIGA ANSWERS

Whatever your problem with the Amiga, our team of experts will solve it for you. Your questions can be about any sort of hardware or software as long as they are to do with the Amiga. If our panel can't come up with the answer then no-one can. Turn to page 8 for some examples. So get those queries and tips coming in to:

Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW

Sitting on a Bodega Bay

by Bob Wade

Bodega Bay is not as you might think a seaside resort; it is in fact a brand new modular expansion console from America's California Access.

Designed to give the A500 owner the same expansion capability as on the A2000, but at a lower cost, it is to be distributed in the UK by the Amiga Centre Scotland. The price, though not yet fixed, should be about £350.

The console does not require any internal fitting to the 500. It just plugs in and has its own built-in power supply that dispenses with the A500's and the monitor's so everything operates from one power switch.

The unit gives you access to four A2000-compatible card expansion slots into which you can plug hard disk cards, RAM expansions, etc. Three of the four are also IBM compatible so, with a Bridgeboard attached, IBM-compatible software and hardware can be run. This is further aided by two extra drive bays in which you can install 5.25" or 3.5" floppy drives.

The console provides a good platform for placing the monitor on – a welcome solution for 500 owners with restricted desk space. Martin Lowe of the Amiga Centre is delighted with the Bodega Bay and joked that the only problem found with it so far was "that we just can't find anything it's incompatible with".

Amiga Centre Scotland ☎ 031-557 4242
California Access ☎ 010 1 408 378 0340



Definitely the stylish place to plonk your monitor. Expandability and price could make it a first resort.

KUMA SPREADING OUT

by Cliff Ramshaw

High-powered Amiga users previously dissatisfied with available spreadsheet packages should take a look at *K-Spread* 4, the newly released top-end spreadsheet from Kuma Computers.

As well as offering features present on earlier versions, such as the ability to read and write Lotus files and user-defined functions, *K-Spread* 4 can draw graphs and remember sequences of user commands as macros.

K-Spread 4 is available for £99.95. Owners of *K-Spread* 2 can obtain an upgrade for £40.

Other Kuma products scheduled for release in March include Amiga versions of a range of clip art previously only available for PCs, Macs and STs.

The technically minded can look forward to '*Intuition: A Practical Guide for Amiga Programmers*' by Mike Nelson, which aims to explain the more arcane elements of the Amiga's graphics interface. It costs £14.95

Finally, *K-Roget*, the thesaurus-on-a-disk based on Longman's Pocket edition, is the subject of a promotion till the end of June. During this time it will be available for £29.95 rather than for the normal price of £49.95.

Kuma Computers ☎ 0734 844335.

WRITING ALL OVER THE WORLD

by Cliff Ramshaw

Multilingual Amiga users can look forward to the release this month of German and Swedish versions of Arnor's *Protext* 5 word processor. As well as coming with the relevant spell dictionary, the program reports all status and error messages in the appropriate language.

In addition, French, German and Swedish dictionaries are now available for use with Protext at £34.50 each. More dictionaries are planned for the future and include Dutch, Spanish, Italian and Portuguese.

Arnor ☎ 0733 68909.

HUMAN READ/WRITE ERRORS

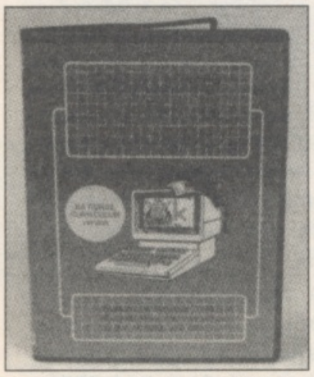
by Cliff Ramshaw

Parents worried about declining standards of literacy in schools can now give their children a little extra help with LCL's Reading Writing Course for the Amiga.

Aimed at three to eight-year-olds, the course has been designed with the National Curriculum in mind and covers material up to attainment target five. It is the latest in a series of courses produced by LCL covering such subjects as maths, English and French, all available for the Amiga.

The course uses colour graphics, animation and music to enliven the learning process. It consists of 24 programs, two books and an audio tape and costs £24.

LCL ☎ 0491 579345.



A package to help send kids quite literately back to school.

POWER HARD DRIVE

by Mark Smiddy

Power Computing has announced a new Slimline 40Mb hard drive.

An IDE (integrated drive electronics) low power mechanism affords the unit its compact size (230x100x30mms) and avoids the need for a cooling fan.

Full compatibility with the Amiga's AutoConfig system allows the drive to autoboot when used with Kickstart 1.3. Unusually, the Slimline has an internally fitted interface instead of the directly mounted method. The drive is then attached by a run of ribbon cable. This saves desk space but makes RAM expansion impossible.

The system will be bundled with ICD Utilities, making installation and backups as painless as possible. A full review will appear in *AS*, issue 1.

Power Computing ☎ 0234 273000

BERLIN HOSTS AMIGA SHOW

by Peter Jones in Belgium

Amiga '91 Berlin will take place at the Berliner Messe convention complex in Berlin from April 25 - 28. All the 5,000-square metre exhibition space has been taken and more than 80 exhibitors will be attending, including the show's two official sponsors: Commodore Buromaschinen GmbH and Amiga/Magazin/M&T.

Expected attendance this year is estimated at around 40,000 people, compared to a record 67,000 at the show in Cologne last autumn.

Ticket prices are 12 Deutschmarks for students and 17 DM for adults. Discounted tickets can be purchased in advance at 10 DM for students and 15 DM for adults.

For further show details contact AMI Shows Europe ☎ 010 49 8106 31093

MANDARIN MAGIC

by Cliff Ramshaw

Mandarin Software, maker of AMOS, is set to release the *Funschool Magic Storybook* – an animated reading package aimed at five to seven and seven to twelve-year-olds.

The first package, described by Mandarin as containing 'a little bit of magic', should be available by mid-April, and will include 'Goldilocks and the Three Bears'. Further stories on additional data disks are planned.

A French version of *Funschool* 3 is also planned. As with the English version, it consists of six individual programs dealing with such subjects as numbers, spelling and reading. *Funschool* is sold in three separate packages for the under-five, five to seven and over seven age groups.

Also in the pipeline are French, German and American (using NTSC rather than PAL video) versions of the AMOS interpreter.

AMOS fans will soon be able to get their hands on the AMOS Compiler, which should be available by April. Claimed to be compatible with all AMOS programs, it should typically double their execution speed.

Mandarin's software development team has been joined by Marc Dawson, formerly of software house Eldritch the Cat. He joins as senior projects manager.

Mandarin Software ☎ 0625 878888.

PICTURE DISK

by Bob Wade

Most people have heard of photo libraries, but now Nik Williams Broadcast has introduced the first Amiga-based picture library. Called Pictureware, for £4.99 you will receive a disk containing five digitised pictures of extraordinarily high quality.

This novel idea is made possible by the use of a broadcast-quality camera to digitise the pictures with *Digi-View*. It produces quality on-screen images that can easily be mistaken for a still TV picture.

Pictureware is the brainchild of Nik Williams and he thinks the possibilities for it and similar ventures are tremendous. Apart from Pictureware he specialises in film and video work for television, so he should know impressive graphics when he sees them.



This impressively clear digitised image of Vietnam is just one entry in the first Amiga picture library.

All the pictures in the library were actually taken by Nik and so far he has the following list of two-disk sets, each set costing £9 or £4.99 for one disk:

Marinas and boats, Edwardian photographs, African animals, pets, rocky coastlines, beautiful sunsets, people, motorbikes, views of Vietnam, children, silverback gorilla, African famine, art in photography, the nude, hippos, African pygmies and film crew on location.

Nik Williams Broadcast ☎ 0792 470503

BETTER BY AMIGA DESIGN

by Peter Jones in Belgium

Toronto-based Ditek International has released its 2D and 3D CADD program, *DynaCADD*, for the Amiga.

Described as "the most powerful, professional CADD solution for the Amiga", the manufacturer claims its use of a context-sensitive on-line help feature and a sophisticated graphical user interface helps to significantly reduce the learning curve associated with CADD programs.

Minimum requirement is a 68020, a math co-processor, 2Mb of RAM and a hard drive. RRP is £650 plus VAT. Contact Expressworks ☎ 0252 726255.

Colourful Collection

by Cliff Ramshaw

Grabbing colour images for the Amiga will soon be less bother with the release of 'The Complete Colour Solution' by Rombo.

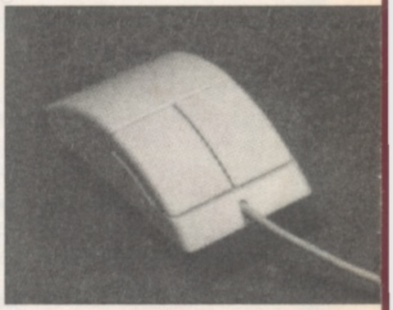
The package bundles together software and equipment previously sold separately: Vidi-Amiga, VidiChrome-Amiga and Vidi-RGB. Vidi-Amiga digitises the incoming signal in monochrome; Vidi-RGB filters the signal into red, green and blue components so it can be converted into a colour image by VidiChrome. The package comes complete with *PhotonPaint* at £179.

Rombo ☎ 0506 414631.

A SCAN OR A MOUSE

by Cliff Ramshaw

Pandaal Marketing is releasing the DAATAmouse onto an already crowded market. It works with both the Amiga and Atari and has a resolution of 280 dots per inch. Price is £39.99.



Is this the world's first aerodynamic rodent?

Also new from Pandaal is the DAATAscan Pro, a hand held scanner already familiar to Atari users. The Amiga version is supplied with editing software that creates monochrome and grey scale IFF files for use in DTP or paint programs. Scanning resolution can be selected from 100, 200, 300 or 400 dpi. Pandaal Marketing ☎ 0234 855666

GET OFF TO A DATAFLYER

by Bob Wade and Cliff Ramshaw

Trilogic now has available the new Dataflyer SCSI interface card from Expansion Systems in the US. Currently only the A1500/A2000 compatible version of the card is in stock at £89.99, but the A500 version is expected to follow as soon as it is available.

The card is compatible with most SCSI drives on the market. SCSI – Small Computer Systems Interface – is the industry standard for Amiga and other hard drives.

It comes with a bare controller card, but Trilogic can supply one of a variety of SCSI-compatible drives already fitted. Typically, the card with a 49Mb drive will cost £349.99.

Once installed, the drive can be configured to autoboot, removing the tiresome need to replace the Workbench disk every time you power up. The software required for installing and configuring the drive is supplied.

The A500 version, when it becomes more freely available, will be more expensive as it will come with a chassis of its own

Of particular interest to A500 owners will be the option of an add-on 4/8Mb memory card. This makes for a useful feature as an additional drive takes up the slot normally used for memory expansion beyond 1Mb.

Trilogic ☎ 0274 691115 AS

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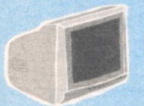
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Amiga POWERPLAY

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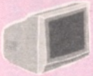
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Harwoods PACK 7

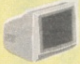
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(Please refer to Page 3)



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AMIGA ANSWERS

We've assembled the best panel of Amiga experts in the land and every month they'll be getting together to help solve your problems. Trivial or techie, we've got the answers

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That's the task we have set ourselves in trying to give you the best possible support for your Amiga. We are confident that our experts can cope with anything you can throw at them. If they don't already know the answer to your problem then they will find it out. Read on for some of the typical, and obscure, problems you may encounter when trying to get the most out of your Amiga

CONSULT THE PANEL

We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga then we will help out. What we cannot do is offer this sort of service over the telephone – do not phone us with your enquiries, but write or fax us at the address and number below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a delay in solving your problem, but because most of the panel do not work in the main offices and we have to have time to produce the magazine every month, it's unavoidable. We will come up with an answer for you but you will have to be a little patient to wait for it to appear in print.

Send your questions to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Fax: 0225 446019.

The Amiga Answers panel consists of all three consultant editors – Jeff Walker, Mark Smiddy and Phil South – and of course resident technical editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping on any subject at all. Each panelist will be dealing with queries in their own specialist area and it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem. Below is a list of their areas of expertise. It's a list that we will add to and update every month so you will know who to write to about any subjects not mentioned here.

Jeff Walker – desktop publishing, programming.
Mark Smiddy – AmigaDOS, business, CDTV, hardware projects, drives.
Phil South – public domain, graphics, AMOS.
Cliff Ramshaw – anything else – including playing guitar, painting, writing fiction, reading poetry and philosophy.

JARGON BUSTING

DIRECTORY: A named area of a floppy disk in which files (and more directories) can be stored. Same thing as drawers in Workbench.

ICON: A picture on the Workbench of a tool, project, drawer or disk.

LIBRARY: A collection of routines accessible to all programmers.

SHELL: A program that provides a window into which AmigaDOS commands can be typed. Also called CLI – Command Line Interface.

SUFFIX: That part of a filename after the dot – .info, for example. Also called the extension part of the filename.

INTUITION: The section of the Amiga's operating system concerned with windows, screens, icons, gadgets, menus and the mouse.

Of course, nobody's written in yet. So, masquerading as a bevvy of hapless Amiga owners, Jeff Walker and Cliff Ramshaw have put together some Q & As.

Q

Directory inquiry

How do I get a directory of a disk other than the Workbench disk? If I open the Shell, put the disk I want to look at in the drive and type Dir DF0:, the computer asks for the Workbench disk back and then gives me a directory of the Workbench disk. Help!

A

Simply type:

```
Dir
```

followed by the name of the disk:

```
Dir Mydisk:
```

You will be prompted to insert the disk you named into any drive. If you don't know its name, type:

```
Dir ?
```

and wait for the template prompt (a long list of capital letters and slashes).Then insert the disk, wait for it to be accepted by Workbench (the drive light will flash for a short while) and type:

```
DF0:[Return]
```

If you've got plenty of memory to spare and you are using Workbench 1.3, Dir can quite easily be turned into a resident command by typing:

```
Resident Dir Add
```

into the Shell. This can be done with any of the C directory commands on the Workbench disk, but the more you make resident, the more memory is lost.

The best solution is to buy an external drive (see our com prehensive external drives test in this issue). You can then keep Workbench in DF0: and use DF1: for everything else.

Q

Dynamic array

How I do I create a dynamic array in C? I want the maximum number of elements to be limited only by the available memory.

A

First define a pointer to the elements that make up the array:

```
int *array;
```

Next use AvailMem() to see how much RAM you have to play with:

```
size = AvailMem(MEMF_PUBLIC);
```

And calculate how many array elements can be stored in this space:

```
max_elements =
size/sizeof(*array);
```

This shows the maximum number of elements that can be used at that time. The number may change frequently when multitasking so you must check for memory each time the array needs to be enlarged. Allocate memory with:

```
array = AllocMem(sizeof(
*array)* elements,MEMF_
PUBLIC);
```

'Elements' is the new number of elements in the array – less than 'max_elements', of course.

Q

Wobbly problem

How do I get white letters on a black background in *Professional Page*? I can't find an option for it in any of the on-screen menus and the manual doesn't seem to mention it anywhere.

A

Assuming you're using v1.3, to make a wob – it stands for white-on-black – first you must make your box a solid black by selecting Box/Alter/Active and clicking the Frame gadget on; that's the one on the far right. Next select Draw/Fill Pattern and the solid black rectangle, followed by Color/Fill Color/Black. You now have a black box.

To create white text in this box you should click on the text tool, then click in the box. Select your typeface, point size and style as normal (wobs are normally Bold), followed by Color/Ink Color/White. Then type in your text.

In *PPage* 2 the process is slightly different. Box colour is chosen from Draw/Fill Color and text colour is chosen from Type/Color.

Q

Icon of style

I've written an AmigaBASIC program that saves data files, but always with that same old boring icon. How can I get it to save the program using an icon that I have designed?

A

You'll have to use some library functions. First, make sure your icon design – let's call it MyData.info – is stored in the same directory as your AmigaBASIC program. Use the following lines at the start of your source code:

```
LIBRARY "icon.library"
DECLARE FUNCTION
GetDiskObject& LIBRARY
DECLARE FUNCTION
PutDiskObject& LIBRARY
DataIcon$ = "MyData"+CHR$(0)
DiskPointer& =
GetDiskObject&(SADD(DataIcon
$))
```

Use the ConvertFD program (on the Extras disk) beforehand to create an icon.bmap file and store it in the same directory as the program. You should not specify the '.info' bit of the icon's file name when assigning it to the DataIcon$ string – GetDiskObject() will then add that suffix on to the end of the file name automatically.

Once your program has written and closed the data file – let's call it Stuff.dat and assume it has been saved to the main program's directory – you will need to tell Intuition to create the icon for it:

```
DataFile$ =
"Stuff.dat"+CHR$(0)
result =
PutDiskObject&(SADD(DataFil
e$),DiskPointer&)
```

The value of the variable result will be true (-1) if everything went smoothly and false (0) if the '.info' file could not be written.

Q

Program puzzle

What languages can I use to program my Amiga? Basic is far too slow, and C and assembler both look horribly complicated.

A

You might want to try AMOS, available for £49.99 from Mandarin Software (☎ 051 357 1275). This is an interpreted language much like AmigaBasic, but programs written in AMOS have better access to the Amiga's graphics capabilities and will run much faster.

If you want the sort of speed that C or assembler will give you, another option is Modula-2. This is the successor to Pascal. Both were designed by Niklaus Wirth. Using it you can do pretty much anything you can do in C, but listings are a lot more readable and Modula-2 is better at picking up programmer errors before it is too late. Real Time Associates (☎ 081 656 7333) sell M2 Amiga for £125.

Q

Empty headed

What on earth is the use of the Empty drawer on Workbench?

A

As you're probably aware, drawers are the Amiga's version of what on other computers are called directories. (If you are working from the shell they are called directories too, just to be confusing.) These are used to store files in a hierarchical manner so that retrieving files is as quick and easy as possible.

It may be that you have a new group of files, say notes for the Notepad, and want to store them together in a new drawer.

There is no method available from Workbench to create a new drawer. Instead you have to take a copy of the Empty drawer and then use the Rename function (from the Workbench menu) to give your new drawer the name you want.

Apparently the much awaited version 2 of Workbench has a means of directly creating new drawers and so eliminates the need for an Empty one.

Q

Printer for Picasso

I have just bought an Amiga 500 and bundled with it was *Deluxe Paint* II. Having drawn lots of wonderful pictures, what sort of printer do I need to make colour copies of them?

A

Unless you are a professional and you're willing, or even able, to pay thousands for a colour laser printer, your best option is a colour dot matrix printer. These are available in 9 and 24-pin versions; pin numbers refer to the number of pins on the print head that strike the paper. The more pins, the finer the detail of the output.

A colour dot matrix printer has a ribbon with several different bands of colour (the Star LC24-200 features black, purple, orange, green, pink, blue and yellow). The colours can be juxtaposed to create a host of extra shades.

Obviously, your Amiga has a whole lot of possible colours, so the resulting printed image is usually going to be an approximation of the image you had on your screen. Even so, if you choose the colours of your on-screen picture carefully you can get some pretty spectacular results.

Unfortunately, printing a picture in this way can turn out to be a very slow business, but you pays yer money and takes yer choice. Colour printers, such as those in Star's LC range, start at about £200. AS

TALKING SHOP

Don't just sit there letting us do all the talking – we want to hear what YOU have to say. After all it's you that have made the Amiga the huge success it is. Send us your opinions on the Amiga, *Amiga Shopper*, Commodore, piracy, Wimbledon's diminishing reliance on the long ball, how old it makes you feel to have a Clash track on a Levis' ad, why you are one of the five per cent of businessmen that is optimistic about the coming year, why Jive Bunny are actually a complex, philosophical allegory of modern society and not just crap, what you think of the new ring-pulls that stay attached to the can – or anything else that might interest the editor enough not to roll it into a ball and vigorously slam-dunk it into the wall-bin shouting "two points, suckers".

Letters can fall into two categories – long wibbly ones that will probably get hacked up and receive £5 if printed and Short and Curlies that must be less than 50 words long and also get £5 if printed. You all have something interesting to say, so say it to us and earn yourself a fiver. Write now to: Talking Shop, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW or FAX on 0225 446019.

I SEE NO TIPS

Don't need our help? Reckon you can do a better job of giving advice and tips on a subject? Well, do it! As well as asking for advice we want you to give too. If you have discovered a tip for any program, hardware, language etc, then send it to us and if it's any good we will use it on the Amiga Answers page and bung you £5 in return. If you think we got an answer wrong or failed to give the full picture then give us what you think is the right answer – we might even cough up some cash for that too. So don't just sit there, get tipping and help out your fellow Amiga owners. Send your tips to: Amiga Tips, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

Ultimate drive

Extra floppy disk drives are considered to be the essential upgrade for all Amigas - but what makes them tick and how hard can you push them? MARK SMIDDY takes the wheel



"I am determined to bring you the most stringent reviews ever attempted, and if that means physically having to break a unit during stress testing (pause for mad cackling) then so be it."

MARK SMIDDY

Welcome to the first in a regular series of bench-tests to end all others. The average second drive will have to endure being bashed, dropped, used as a coffee mat, roasted under the sun; probably have some sticky liquid spilt on it; and who knows what else. All that in addition to suffering around 12,000 hours use and 20,000 disk insertions and removals! You begin to understand why this test can take no prisoners; only the strong must survive.

The need for speed

Most people realise they need an extra drive when using the Workbench for the first time. Even simple operations like copying disks mean constantly swapping disks. An extra drive solves this problem immediately.

The Amiga supports a total of four drives – three external. Who needs that many? Perhaps surprisingly, three or four drives can be very handy at times. Many programs are now supplied on two disks which may be in constant use, so the extra drive could be used for storing extra data. PD libraries and computer clubs could use an extra drive for copying their software as the Amiga can read and write two pairs of disks at once.

Now your appetite has been whetted, a warning. The Amiga 500's power supply (PSU) is not powerful enough to support more than one external drive, so if you want to run extra drives you will have to either upgrade the power supply or buy drives with their own PSU.

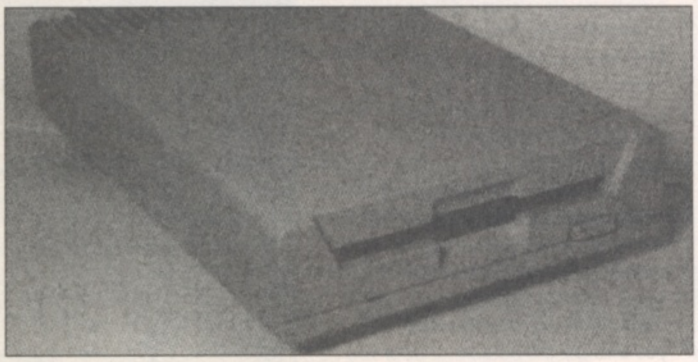
The hardware; the history; the arcane secrets of floppy data storage; all exposed here

The choice for potential buyers has never been better, but the floppy drives market is very susceptible to change. It seems like only yesterday when almost every drive had a track display fitted. Now, only one manufacturer offers this option. Similarly there was a time when 5.25" units were ten-a-penny, but a shift in manufacturing and buying trends has seen them disappear almost completely.

Drive destruction derby

Before looking closely at reviews of the individual units, it must be said that all the drives performed admirably and exceeded all expectations. The plastic cased units in particular stood up well to some severe hammering. Even I shudder to think of the punishment meted out. Time being of the essence, the drives' degradation had to be accelerated. In a normal environment, all the drives featured should enjoy a long life.

Commodore A1011



Revamped styling puts Commodore's A1011 a step ahead in the fashion stakes, but good looks can be deceptive.

As a direct replacement for the grotesque A1010, the A1011 features a completely redesigned case, but at 50mm high is still the tallest single drive reviewed. It stands out from the rest in design terms too. Commodore's stylists have designed a casing that closely mirrors the Amiga A500. In a world where aesthetics are considered almost as important as good design, this is a big plus, though cynics would probably argue otherwise.

However, smooth operation should never be sacrificed for functionality and this is where the A1011 falls down. It works well when atop an A500 with both drives lined up, but when placed in a normal forward-facing position, pinkies can easily get pinched as the disk clicks home.

At the end of the 0.5-metre cable is a robust, moulded plug branded by Commodore. An unusual point is the short fixing screws; when the plug is screwed home only 5mm of the knurled heads protrude and prying fingers would be hard pressed to dislodge them.

The lead flows into the case through a cord grip, connecting to the PWB via an IDC connector. The Chinon mechanism rests on its own metal sub-chassis.

The big letdown is the lack of a throughport and a disable switch, both of which people expect these days. Although the unit may be intended for the A500, whose PSU cannot support more than one external drive, these are glaring omissions.

Though the A1011 won't win any prizes, it's one of the best designed drives reviewed.

CHECKOUT

Features..............**10/25**
The moulded plug looks nice – but where's the throughport?

Styling................**10/10**
Looks good and, er, has Amiga written on it.

Durability **10/25**
Physically strong enough but a poor quality plastic.

Price....................**30/40**
Expensive compared to the other third-party competition.

Overall **60/100**
Nothing wrong with it at all – it's just that the competition is better.

Floppy Drives – Past, Present and Future

Given that 3.5" floppy drives are supplied as standard with just about every new small computer system, it seems strange that floppy disks were never envisaged to be such. The first mass-market floppies were 8" units intended primarily for transferring data between different computers. Although much slower than tape and hard-disk packs, they were lighter, more rugged and more convenient. The popularity of small, personal computer systems soon caught the imagination of designers and many drives found homes in early CP/M systems. Sales peaked in 1983 with just over 1 million units sold world-wide, declining to 200,000 by 1990.

Small is beautiful

With users demanding more storage space and smaller drives, the 5.25" market took over in 1981 and climaxed in 1986 when sales hit a staggering 15 million. There is little doubt this was due to IBM, among others, adopting the standard for their PC systems.

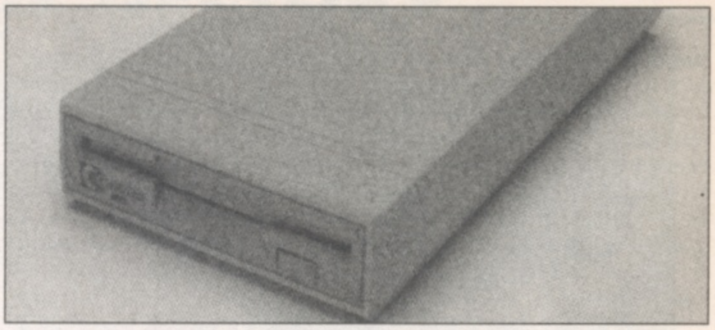
By early 1985, the 3.5" standard was already starting to threaten the 5.25" market as Apple adopted them for the Lisa and Macintosh systems. Nevertheless, IBM stuck with 5.25" for the AT systems and this kept the market alive longer than might be expected. Although figures are not yet available, statisticians predict that by the end of 1990, 5.25" systems will still account for around 11 million units.

Despite IBM's desire to keep to the well-tried 5.25" formula, 3.5" drives soon became the public's favourite and the disk's perceived durability probably led to IBM adopting them for the PS/2 systems. Latest figures show 3.5" drives with mass market sales of around 22 million. This is expected to peak at 25 million by 1992, dropping around 20 million at the turn of the century.

GET IT RIGHT

The information in all our buyers' guides will be as reliable as we can possibly make it, but there are bound to be times when something gets missed out, and of course they will require updating over the months. If you think we have made a factual error or missed something out then write to us at the following address and we'll make the necessary changes: Guide Updates, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW

Cumana CAX 354



Another sexy drive from Cumana, pictured before the plastic casing cracked up under pressure. Not bad for a cheapie though.

Cumana has been synonymous with fine disk drives since the Acorn BBC days. Until recently, the company cased all their units in solid metal boxes. Thus the plastic casing embracing the CAX 354 comes as a shock. More surprisingly, the company was unusually reluctant to give us one for review. In the end, I had to purloin one from our illustrious editor and hope he didn't ask for it back! *(I've got a bad feeling about this – Ed.)*

Externally, the CAX 354 is one of the nicest looking drives as the moulded plastic case obviates the need for fixing screws. However, the avant-garde angled edges proved a weakness, because the clam-like casing cracked at the front even before I attacked it with a screwdriver. *(I've got a very bad feeling about this – Ed.)*

Once inside, the unit looks well made. However, the way the motor board hangs perilously on the drive's rear connectors may give cause for concern in the years to come. The lead is connected by through-soldering the 20 wires, so these too may fail. To be fair, both these potential problems are eased by the metal anchoring plate mounted at the rear of the case and the large cable grip. A similar snag exists at the plug. This has been manually soldered and correctly sleeved, but is let down by a poor quality case; the excessively long screws were all too easy to snag.

BLITS & BOBS

Amiga drives are notoriously noisy - and the loudest are made by Commodore!

CHECKOUT

Features.............20/35
Just a basic drive with no frills.

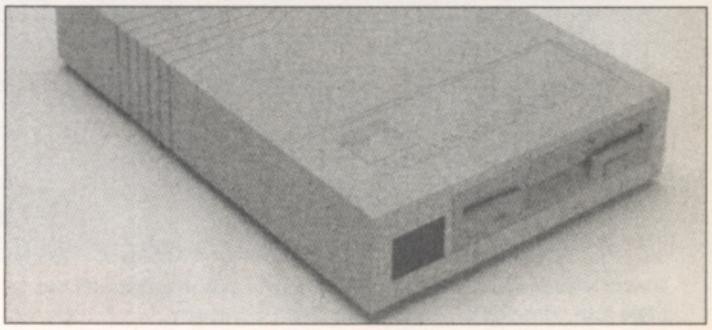
Styling................10/10
Well designed exterior – but it can take a battering.

Durability 15/25
Mechanically weak plastic case but good solvent and heat rejection.

Price...................35/40
Not too expensive but it gives the lowest third-party performance.

Overall 80/100
A good all-rounder, but it is falling behind the competition.

Golden Image (with track display)



This yummy block of ice-cream does not come with wafers, but it does have a built-in track display.

Track displays went out with Noah – after all who needs them? Well, Golden Image (and Golem) take a different view. Since Amiga drives are very much the same, everyone needs a gimmick to separate their drives from the rest.

Like the Cumana and Commodore drives, the Golden Image unit is cased in tough plastic. Despite repeated and sustained attempts, the casing failed to break – even when trampled on. This moulded effort, though still looking like a block of ice-cream, has allowed Golden Image to emblazon their emblem clearly on the case.

The unit performs just as well as the rest but the track counter has its moments. Rather than appearing all the time, it only lights during disk access. Even then, the seven-segment display dims noticeably when more than three segments are lit.

A more pleasant surprise awaits inside. The TEAC mechanism is screw-mounted on four pillars – unlike the peg supports found in the (albeit smaller) Cumana and Commodore offerings. Like the Cumana drive, the motor board connects directly to the drive interface, but is fixed independently, assuring a more solid construction. At nearly .75m, the lead was one of the longest and it fits on to the board via a single IDC connector.

However, it isn't all good news. Although the designer has been careful to use a mechanically sound product, the construction of the PWB leaves a lot to be desired. One of the diodes looks as if it has been shoved home rather than made to fit. This is one area Golden Image should aim to improve on since it is this that will determine the long-term reliability demanded by users.

CHECKOUT

Features.............20/25
Built-in track counter adds something – but do you want one?

Styling..................7/10
It looks like a block of ice cream ...

Durability 15/25
... but its plastic casing stands up to the hammer well.

Price...................33/40
Not one of the cheaper drives available but still competitive.

Overall 75/100
Another competent drive that will serve you well.

continued on page 12

continued from page 11

Power External Drive



The metal case of Power Computing's butch little drive took a hammering with nary a whimper. Not very flash though is it?

Power's drives have a reputation for being robust and reliable. This is not so much to do with the drive mechanism as with the sturdiness of construction.

All Power's external drives come encased in a rigid steel box – a design which has stood the test of time. The single unit currently shipping stands at just over 30mms high – lower than the Cumana, but a full 20mms longer. Nevertheless it looks and feels considerably stronger.

Removing the casing reveals a lot more about this tough piece of kit. The mechanism is mounted on a base-cum-backplate into which the cover screws, resulting in a very rigid box. Like the Cumana box, the motor board is slung from the backplate. However, since the plate is part of the base it is less inclined to flex under stress. The motor board connects to the drive by a short run of ribbon cable, but the extra durability this affords means a few extra millimetres are added to the unit's dimensions.

Without doubt the best feature of all Power's Amiga drives is the thoughtful inclusion of an anti-click device. This small piece of extra circuitry silences those annoying polling clicks when the drive is empty and puts the unit ahead of the field.

CHECKOUT

Features..............**25/25**
The anti-click feature gives this the edge over its competitors.

Styling...................**5/10**
Looks tough but utilitarian.

Durability...........**25/25**
An excellent all-round performance from the metal case.

Price...................**38/40**
It's a low-cost drive that also performs extremely well.

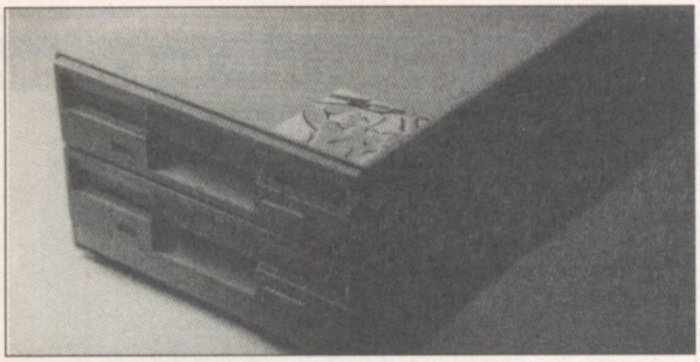
Overall............**93/100**
You can't argue with affordability and performance.

CHANGING STANDARDS

Despite attempts by some to get other physical formats accepted – typically 3", used mainly by Amstrad CP/M systems and 2" in some musical equipment – the 3.5" drive has become a standard in its own right. It seems unlikely there will be another shift for some years as the 3.5" drive has such a firm stronghold. It is more that probable media storage will continue with floppy disks and run parallel with other developments like "smart" cards, re-writeable CDs and WORM (Write Once Read Many) drives.

Nevertheless there is still a trend to get more information crammed into the same amount of space. Although there are theoretical limits (governed by the size of magnetic particles and read/write-head technology) the 2Mb unformatted drive has already supplanted the 1Mb drive found in the Amiga. The next stage will probably be 4Mb. Citizen has already shown its 28Mb system, with Toshiba, Panasonic and others barking at the heels with a 16Mb drive, but It is unlikely these drives will enter mass production until at least 1992.

Power Dual External



Power solves the Amiga twin-drive power problem with all the style and panache of the London Brick Company.

Here is a rule: if you have an Amiga 500, you can only have two drives: one internal, one external. But rules are made to be broken and Power Computing has come up with the solution. The problem with running multiple drives is that the A500's power supply doesn't have the guts. In theory it has – that's what the motor circuit is for – but in practice if more than two drives switch on the PSU will almost certainly fail.

Power's solution is rather elegant. One motor control board contains enough logic to control two drives, so a power supply has been put in the vacant space resulting in a compact dual-drive system which occupies less desk space than two equivalent drives. And because the extra drives are independent of the A500's PSU, you can add a third external drive, taking the machine to its full complement.

The case layout is similar to the single unit, but the backplate is bigger so as to accommodate the power switch. Like the single drive, the build quality is excellent, although surprisingly the upper and lower drives are anchored separately. Four Philips screws hold the upper mechanism very firmly.

It only suffers one trifling problem – that is a slight pop can be heard over a hi-fi system when switching on or off. Also, even though someone has been thoughtful enough to fit the correct fuse in the mains plug, a high-voltage warning sticker should be present to warn off prying fingers.

CHECKOUT

Features..............**25/25**
The internal power supply and anti-click make this a must.

Styling...................**5/10**
It looks like a cream brick and feels like a brick.

Durability...........**25/25**
Like the single drive this too is built to last a long time.

Price...................**28/40**
Despite the low-ish rating remember you are getting two drives not one.

Overall............**83/100**
Expensive, but if you need two drives it's the only thing to buy.

WHY ONLY 880K PER DISK?

One of the questions most posed by beginners is, if the Amiga has 1Mb drives, why can I only get 880k on a disk? Even when they get the answer, most wish they hadn't bothered to ask. Put simply, before the Amiga can recognise a disk it has to be initialised – a process more usually called formatting. This has the effect of dividing the disk up into 1760 little segments – called sectors or blocks – each with a capacity of 512 bytes. Sectors are arranged 11 to a track and 22 to a cylinder.

The apparent loss of storage results because the sectors cannot overlap each other. The extra 120k is used as a gap at the end of each track. Since the Amiga uses 80 tracks and two sides of the disk, about 1.3k is used for the buffer area. It is quite possible to reclaim this space by using custom (sectorless) formats, but this practise is inefficient for normal purposes.

MORE SCORES

If you have a good idea for a rating category or test that we have not got here and would be useful to you in trying to decide what drive to buy, then let us know and we will include it in future tests. The same goes for all the future tests we run on all hardware and software – if you think we missed a rating or test then write to: New Ratings, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

Tracks and Sectors

All floppy disks have one thing in common: data is written in the form of concentric tracks. The disk head reaches each track by moving in a series of steps; the number of steps determines the number of tracks – 80 in the Amiga's case. Although Amiga disks have a diameter of 3.5 inches, the usable radius is slightly less than 1". This means each track has to be less than 1/80" inch wide. In practice the track width is specified at 1/135" or 135 TPI (Tracks Per Inch).

It is not possible to just throw data at the drive and expect to be able to read it back again. The data, and therefore the track, has to start and stop somewhere.

Cramming it all in

Imagine every track can store 10K of data. Now let's say you want to store two files: one 2K long, and another 9K. Either of these can be stored in a single track. But, once that track is occupied by data, it is not possible to append more data to it. In other words, our 11K of data takes up 20K of disk space, which is obviously unacceptable. To get round this, each track is divided into a series of segments, called sectors so files can be split into bite-sized chunks.

Now imagine we sub-divide those 10K tracks into 20 sectors, each 512 bytes long. We have to split the files into smaller chunks. Those two files now take up 2K (four sectors) and 9K (18 sectors) respectively – exactly 11K of disk space.

Sector retrospective

The process of sectoring has come a long way since the days of 8" floppies. In the early days sectors were generated by the disk drive itself – a process know as hard (or hardware) sectoring. The disk was punched with eight holes around the perimeter of the drive hub. As the disk spun, an LED shone through a hole in the disk casing onto a light-sensitive diode. This enabled the drive to generate a set of eight, evenly spaced sector pulses. As each pulse arrived at the computer, the controller would write the next sector.

This system was inefficient as the number and size of sectors was limited by the number of holes. (Punch too many holes and the disk would tear.) When 5.25" drives arrived, a new system appeared using a single index hole. This system, called index sync, marked the start of the track and left software to decide how to lay down the sectors.

Coding the Magic Sync Mark

```
 • •
D D D D D D D D
0100010010001001
 T T T T T T T T
  •

         • •
 D D D D D D D D
0100010010001001
T T T T T T T T
       •
```

D = Data bit
T = Timing (clock) bit
0 = Reset bit in datastream
1 = Set bit in datastream
$4489 = %0100 0100 1000 1001
• Shows position of illegal timing/data marker

Soft sectoring works very well, but as disks get smaller there is less room for a hole. However, the track start and sectors must still be synchronised, so how is this done?

Illegal tender

The Amiga uses a system known as MFM to code its tracks (see How Disks are Written). Because of the way MFM coding works, many binary combinations are illegal and one of them – $4489 – is used as a sync mark. Regardless of whether the first bit represents a clock or data bit, two reset data (D) bits always straddle a reset clock (T) bit. This could never happen with correctly coded data (see Figure 1).

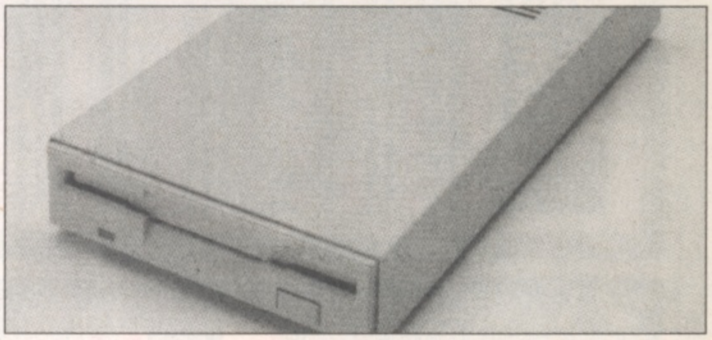
When the drive controller reads $4489 from the disk it recognises it as a sync marker and clocks the index line. Under software control it is possible to set the sync word to any value. Provided that value never occurs in the track (legally coded or not), the start of track sync will be recognised correctly.

880K and up

If the predominance of the PC in disk drive development seems like doom and gloom, with the PC market running off into the sunset and leaving Commodore behind, take heart. The Amiga is an expandable system and many third-party manufacturers have already proved that if a PC can do it, then so can an Amiga. Although 2Mb drives are now very common in PC circles, the trend still leans toward a 720k format – still the lowest common denominator – which equates to 880k on the Amiga. Some manufacturers in the US have already released 2Mb drives for the Amiga (about 1.5Mb formatted capacity).

Such systems are not generally available in the UK, mainly because of their high price. Also, although Amiga hardware can support them, the software (Kickstart) does not. This means that the manufacturers have to supply special "device drivers" to tell AmigaDOS how to handle them. While this is not really a major problem for many users, beginners especially can find it particularly troublesome.

Roctec RF 302



Low price and durability are welcome features from Roctec. The rather useless cooling vents are not.

Roctec's name might not be as familiar as Power Computing's, but initial impressions indicate the company is probably going to become a force to be reckoned with. A short phone call resulted in two of the three drives featured here being sent directly from the manufacturing plant in Hong Kong, with a brief message: "Do what you like to them." This is what the people want!

Externally, Roctec's normal-height drive has approximately the same dimensions as the Cumana, only slightly narrower. The metal casing has more in common with the exceedingly tough Power units – an impression borne out under testing. Unlike the Power models however, Roctec has not used fixing screws in the side casing and this does give them marginally better visual appeal. The only let-down externally is the plastic casing on the plug; the garish chrome effect is reminiscent of cheap model cars.

The best is yet to come. Lifting the lid reveals a beautifully laid out design. Like all the better designs, the cable drops through a slotted cable grip and onto the PWB via an IDC connector. However, Unlike most of the other models the motor-control PWB is firmly anchored to the floor of the case by three pillars. A small run of ribbon cable then connects it to the main mechanism.

A distinctly duff feature of the RF302 is the cooling vents. Although these may add something to the aesthetics, they are completely unnecessary and are the unit's downfall in the liquids test. A small amount of coffee spilled over the motor board, onto the stepper motor and vanished under some delicate parts of the PWB. The long term effects of this have yet to be determined, but you can probably guess they won't be very pretty.

Checkout

Features 15/25
It's another drive with just the basic features and no frills.

Styling 10/10
As drives go this is an attractive one to have.

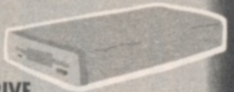
Durability 22/25
Tough as old boots – except for the vents in the top.

Price 38/40
It varies but it's available at about the cheapest prices around.

Overall 85/100
It's cheap and performs well, so you can't go wrong with this one.

continued on page 16

Amiga STORAGE



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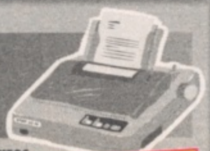
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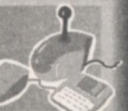
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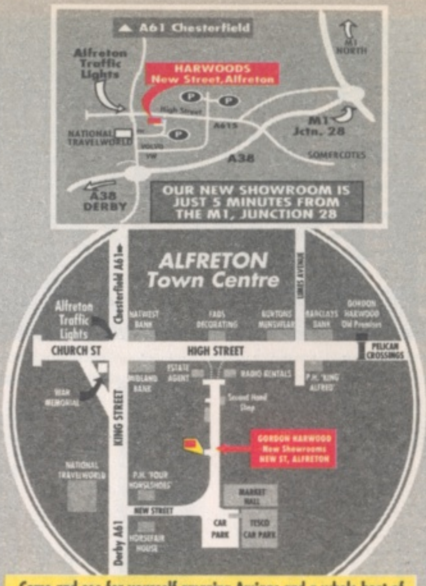
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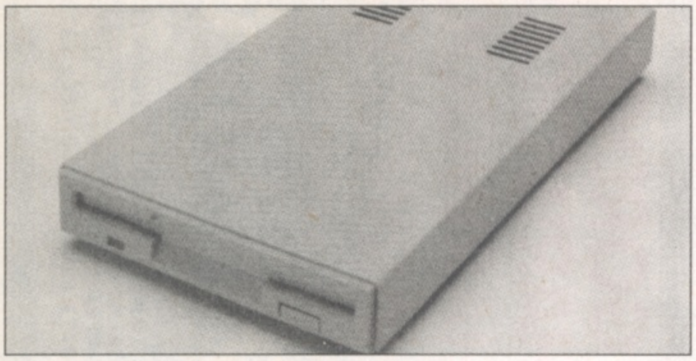
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Roctec RF 332



Roctec's compact and bijou model sports the new Citizen miniature drive. Careful not to lose it among desktop detritus.

At first glance, the RF332 looks identical to the RF302 and in many respects it is. What makes this drive different is the use of Citizen's new miniature drive. At 185 x 25mm the unit is 15mm shorter and stands 5mm lower than its big brother. This might not sound much but can make all the difference on a cramped desktop. Something else worth noting is that Citizen has improved the drive door on the later model to help prevent an influx of foreign matter – dust and fag ash for example.

Internally, the RF332 is solidly built along similar lines to its big brother. However, the reduction in height and length has been achieved by cramming the ribbon cable in far too tightly for my liking. Also, like the larger model, this one spectacularly fails the liquid test taking the full brunt of warm, sticky coffee on its interior through those superfluous cooling vents.

CHECKOUT

Features.............22/25
It's the only drive to use the new low-height mechanism.

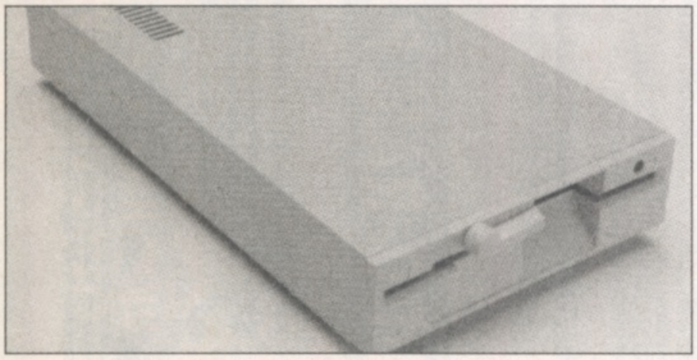
Styling................10/10
The very compact case makes it a nice looker...

Durability 22/25
that also stands up to a remarkable amount of battering.

Price....................30/40
The price is a bit steep for what is still an 880K drive.

Overall 84/100
If space is a problem then here is your answer.

Roctec RF 542C



For those with 5.25" disks, Roctec's RF542 is a handy gadget, apart from the rather dippy DIP-switch drive disable.

Roctec is one of the few manufacturers left that is still making a 5.25" floppy drive for the Amiga (Cumana has one too). This seems a pity given the price-per-byte of 5.25" disks. The solidly constructed RF542 is a super unit if you happen to have a PC-1 (Commodore's ill-fated entry-level PC) because it is compatible with that too.

Unlike a normal PC drive, the unit behaves just like a normal drive when fitted to the Amiga, the only difference being it uses 5.25" floppy disks. Although this drive is not compatible with the PC transfer software supplied on the Workbench, it is ideal for making backups. Other PC-Amiga utilities, such as DOS-2-DOS, MessyDOS and CrossDOS, should be compatible, but they will see the drive as a 3.5" unit. Construction quality is high, as might be expected, though the sticky label used to mask the backplate is prone to falling off.

The only bad feature is the way the drive disable switch has been implemented. A tiny, four-way DIP switch pokes from a recess at the rear offering several different configurations, including the 40-track 360k PC-1 setting. Another position determines Amiga with drive disabled. Since these positions are not clearly marked on the case, if you lose the tiny manual (I did) you're in lumber! Also, these switches are notoriously difficult to set without a suitable tool. A ball-point pen is often suggested, but this can flick two switches at the same time.

The drive mechanism used is a pre-loaded type. This variety places the heads on the disk when the drive door is closed rather than waiting for a disk access and results in quieter operation overall, but a shortened media life. Interestingly, the normally quiet mechanism has one of the loudest clicks when the drive is empty.

CHECKOUT

Features.............20/25
An ordinary drive which offers some PC compatibility.

Styling...................6/10
Yet another drive looking like a value pack of vanilla ice cream.

Durability 20/25
Again the cooling vents on top are a cause for concern.

Price....................28/40
Expect to pay around £110, but at least the disks are cheap.

Overall 74/100
If it's 5.25" disks you want to use then this is the answer.

BLITS & BOBS

The Amiga can be made to read disks written on the PC, the ST and the Commodore 64. The ST can't.

HOW AMIGA DISKS ARE WRITTEN

Data is not written to disks as binary. Instead, a special coding method called Modified Frequency Modulation is used. Here is why:

A disk is coated with tiny magnetic particles and, as it revolves, a read/write head passes over its surface. When the disk is being written, a small current pulses though a coil a coil in the head – in one direction for a high bit and the other direction for a low bit – creating a magnetic field that excites particles into high or low states.

During a 'read', the opposite occurs; the magnetic field on the disk's surface causes a current to flow in the coil. This is where a problem crops up. Disks are analogue devices because they are based on magnetism. But magnetic fields do not just switch on and off; they take a finite amount of time to build up and collapse. Unless some timing is done, the disk controller would be unable to sense where one bit stops and the next begins. This can be overcome in part by timing the length of each bit, but since it is measured in microseconds (millionths of a second) the clock can get confused if faced with long runs of '1' or '0' bits.

MFM codes the data in such a way that long runs of one state never occur. One clock bit is inserted between every two data bits – in effect, doubling the amount of data written. (The stated capacity of a drive takes the various coding methods into account). The status each clock bit (on or off) is determined by its adjacent data bits; if two adjacent bits are reset, a set clock bit is inserted; if one of the adjacent bits is set, a reset clock bit is inserted. For example:

```
Data>  Clock bits>  Result
                    D D D D
1111   0000         10101010
                     T T T T

                    D D D D
0000   1111         01010101
                     T T T T

                    D D D D
1110   0000         10101000
                     T T T T
```

Amiga hardware is also capable of using Group Code Recording as found on the Macintosh. However, GCR is rarely used on the Amiga except as part of early protection schemes.

What Is A Throughport?

It's the socket at the back of most (but not all) drives which enables you to connect extra ones in a chain.

The throughport carries all the signals from the Amiga to each drive in the chain up to a maximum of three.

If the throughport is not wired correctly then two external drives may interfere with each other (ooer!).

If you plug more than three drives in a chain, the Amiga will at best be unable to read one or more of them. At worst you could damage the machine. Do not do this.

Failure to have a throughport fitted in an add-on piece of hardware is an omission that can make expanding an A500 much harder. in most cases there is no real excuse for it.

Power anti-click board

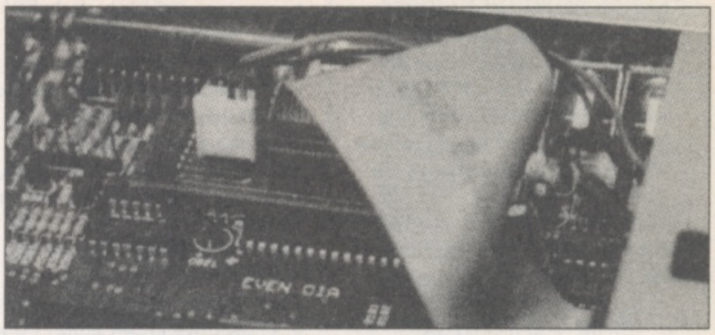
The Amiga's drives click incessantly. This is a fact of life. When Workbench 2 was being discussed, rumours of no-click drives were floating around, but these seem to have died a death. As usual, British ingenuity comes to the rescue in the form of Power Computing's anti-click device.

This simple add-on is incorporated in all Power's drives, but that still leaves the A500's internal drive arguably the noisiest one. The solution is beautifully simple. Power's little board plugs directly onto the A500's PCB and completely eliminates the characteristic, click-click-clicking.

Fitting the board is straightforward. Although it only fits one way, by virtue of the machine's design it is all too easy to get one or both of the leads reversed. If your machine is still under guarantee, this is one job best left to an expert who can replace the warranty label.

At £19.99, the anti-click device might be considered an essential upgrade for all Amigas that get used for anything except, perhaps, for playing games.

Next month, if the Editor has forgiven me for breaking his drive, *(some chance - Ed)* sees the start of a regular electronics section. By special arrangement with those nice people at Power Computing, I'll be demonstrating how to make one of these super trick anti-click gadgets yourself. So put all those stoopid games away and dust off your soldering irons - *Amiga Shopper* has landed.



It's cheap, it's trick and it stops the click. Power's neat solution to noisy Amiga disk drives gets a hearty congrat or two.

BLITS & BOBS

The Amiga features potentially the fastest and most advanced drive interfaces on any home micro. Unfortunately, the Amiga's Disk Operating System slows them right down.

JARGON BUSTING

$4489: The magic sync mark or number used by Modified Frequency Modulation-coded disks start of track marker.

BOOTBLOCK: The first two sectors of an AmigaDOS disk located at track 1, side 0. The bootblock is used to describe the filing system in use and can contain a special program to boot certain disks. This is how most simple viruses get into the system.

CYLINDER: A collective term used to describe a number of disk sides. All Amiga floppy disks have 80 tracks a side – 160 tracks in total. The number of tracks divided by the number of sides yields the number of cylinders. Cylinders are simulated in DOS by writing first to one side then to the other so, in effect, each track looks twice as long.

DOS: Disk Operating System. On the Amiga, this acronym is better described as Device Operating System since AmigaDOS controls more than just disks.

FM: An outdated recording method used by early systems.

FORMAT: A process of preparing a floppy disk so that it can be used by the Amiga.

KEY: The AmigaDOS term for a disk sector.

KEY 880: Location of the root directory on an AmigaDOS floppy disk.

GCR: Group Code Recording. Alternative method used to record data on disks - available, but not generally used on the Amiga. GCR is more space efficient but slower than MFM.

INDEX HOLE: Small hole punched in the surface of 5.25" floppies which is used to synchronise the start of a track.

MFM: Modified Frequency Modulation. Recording method used by all Amiga disk drives.

NDOS: Not DOS. AmigaDOS displays this code when it recognises the disk's format, but DOS can't be used to read it.

SECTOR: Sub-division of a track where the actual data is stored.

SIDE: the upper or lower surface of a floppy disk.

TRACK: One of 80 concentric rings recorded on to the surface of a floppy disk.

The author would like to thank the following people and companies for making this article possible: Power Computing, Roctec, Golden Image, Commodore UK, Cumana, Silica Shop, Michael Capstick, Andrew Leaning, Phil Jones, Henry Sulley and Sharon Rodrigo. Statistics supplied courtesy of Citizen Europe.

SUPPLIERS

When you make your choice where do you go? The first stop will probably be your local dealer, but few dealers stock the drives listed here – at least, not under their own names. Many distributors now value-add to third-party disk drives by packing them in fancy boxes and giving things away with them. This is in evidence with the Roctec units, which we believe are badged as Qtec (from Trilogic on 0274 6911115) and Xetec. There's nothing wrong with this, but it helps to know what you are buying. If in doubt, get the dealer to open the box the casings are all fairly distinctive.

Drives most commonly found in at local specialist dealers tend to be the ever-popular Cumana models, whereas those sold by mail-order firms are usually made by Power Computing. Again, if in doubt, ask. Most suppliers should be willing to come clean.

Roctec units are more difficult to find in native form. Anyone interested in getting one of the super slimline models can contact their importer Direct Disk Supplies.

The Commodore A1011 is freely available; any Commodore appointed dealer will either stock them or be able to order them. However, you should not contact Commodore directly.

CUMANA
Pines Trading Estate, Broad Street, Guildford, Surrey G3 3BH
0483 503121

GOLDEN IMAGE
Golden Image House, Fairways Business Park, Lammas Road, London E10 7QT
081-518 7373

DIRECT DISK SUPPLIES
Unit 19, Teddington Business Park, Station Road, Teddington, Middlesex TW11 9BQ
081-977 8777

POWER COMPUTING
44a Stanley Street, Bedford, Beds MK41 7RW
0234 273000

READER REVIEWS

We've told you what we think of the drives in our survey. Now it's your chance to tell us what you think about your own new hardware or software. If you get something that is so new we've simply not had a chance to review it, then give us 50-100 words on what you think of it and why. If we use it you will get £5 for your trouble. Send your contributions to: Reader Reviews, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

continued on page 18

continued from page 17

Of all the drives in the Amiga system, it is the internal one that gets the most hammer and therefore, the one most prone to failure. (Some would argue it's cheap and nasty too.) Whatever the reason, the internal drive is bound to wear out sooner or later – certainly before the rest of the system does. Service replacements are quite hard to come by, unless you happen to be a Commodore repair centre, and rather expensive to fit.

There is an alternative though. Power Computing offers a high-quality Citizen drive mechanism which can be fitted in under an hour, even by inexperienced people. Isn't that nice? The drive comes with complete fitting instructions but without leads; you simply use the ones inside the machine. In rare cases the power lead might already be soldered to the drive, in which case Power supplies one free of charge.

Look out for Amiga Shopper's electronics section next month, when we will cover the fitting of this new drive in detail and show you how to build-in an anti-click board at the same time.

Power Internal



Power's mechanism, featuring a Citizen drive, should ward away those knackered internal drive blues when your current one dies.

Drive	A1011	CAX354	Power S	Power D	G Image	RF302	RF332	RF504
Internal PSU	No	No	No	Yes	No	No	No	No
Throughport	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compatibility	OK	OK	OK	OK	OK	OK	OK	OK
Disable switch	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40/80 track	No	No	No	No	No	No	No	Yes
Height (mm)	50	35	32	66	46	32	22	52
Width (mm)	135	116	107	107	143	103	115	148
Length (mm)	200	200	223	241	223	208	192	280
Weight (g)	1,000	700	1,000	2,010	1,000	940	880	2,000
Lead length (mm)	490	610	580	640	790	685	675	665
Plug type	Moulded	Shell	Shell	Moulded	Moulded	Shell	Shell	Shell
Anti click	No	No	Yes	Yes	No	No	No	No
Build	Good	Good	V Good	V Good	Good	V Good	V Good	V Good
Casing	Plastic	Plastic	Metal	Metal	Plastic	Metal	Metal	Metal
Fixing	Screws	Clips	Screws	Screws	Screws	Screws	Screws	Screws
External finish	V Good	V Good	Good	Good	V Good	V Good	V Good	Good
Repel solvent	AC	ABC	ABCD	ABCD	ABC	ABCD	ABCD	ABCD
Repel fire (30s)	No -1	No -10	Yes	Yes	No -15	Yes	Yes	Yes
Repel scratches	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Repel liquids	No	Yes	Yes	-	Yes	No	No	No
Repel dust	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extreme stress	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Pass
Pull breakaway (g)	400	800	400	1,600	1,000	1,000	600	2,600
Pull running (g)	400	200	400	1,400	800	1,000	400	1,800
Mechanism	Int	Ext	Ext	Ext	Ext	Ext	Ext	Ext
Eject throw (mm)	7	2	2	7	7	2	6	-
Eject pressure (g)	600	700	700	600	800	700	800	-
Price	**£99.99**	**£74.99**	**£65**	**£110**	**£84**	**£65***	**£65***	**£99***

* These prices may vary greatly depending on the supplier and badged name.

Summary of Test Criterion

THROUGHPORT: Throughport compatibility test determined if drives from different manufacturers could be connected to each other

REPEL SOLVENT: Four different solvents and bleaches commonly found in the household environment were used, ranging from 'A': a mild bleaching agent to 'D': a powerful solvent. Five ml was applied to the case and allowed to stand for 20 minutes. The cases were then cleaned, dried and inspected for damage. A letter in this box indicates a pass.

REPEL FIRE: A yellow flame was played on the casing for 30 seconds or until the surface showed visible signs of damage. It was known that the plastic cases would not survive; the figure shows time recorded before blemishing.

REPEL SCRATCHES: A sharp stylus was scraped along the drive's casing until the covering became perforated. All of the drives reviewed performed more or less equally.

REPEL LIQUIDS: 300 ml of damn fine hot coffee was poured over the drive casing. A pass indicates that although liquid entered the case, it did not touch any sensitive components. The test was not conducted on Power Computing's dual disc drive as it is mains powered and would have frazzled our reviewer. Do not try this test at home kids!

REPEL DUST: A known amount of fine powder was sprayed at the drive door under slight pressure. A fail indicates more than 20 per cent of the powder entered the mechanism.

EXTREME STRESS: First, the drive was swung pendulum-fashion by its lead. Second, a large man stood on the casing. A pass indicates the case did not crack.

PULL BREAKAWAY: The force (calculated as weight in grammes) required to start the drive moving across an arbitrary surface when tugged by its lead.

PULL RUNNING: The force required (calculated as weight in grammes) to keep a drive moving across an arbitrary surface when pulled along by its lead.

EJECT THROW: The amount of eject button protruding when a disk has been inserted.

EJECT WEIGHT: The amount of force required to eject a disk using the eject button.

Drive not Featured?

During the production of this article every major OEM manufacturer was contacted and offered coverage. Supra Corporation think the UK market well covered already. Golem, AE-Research and Silica (who have two new units) were unable to get review models to us in time. We will do updates when these units arrive.

AMIGA SHOPPER BEST BUY

POWER DUAL DRIVE

Quite simply, the best all-rounder. The internal PSU means no strain on the A500's power unit. The double-deck configuration is cost effective – cheaper than two singles. Not quite as attractive as the Roctec or Cumana singles, but still looks good on a desktop.

AMIGA SHOPPER BEST BUDGET BUYS

ROCTEC RF302, RF332 AND POWER EXTERNAL

All these units can be picked up for around £60. Strong construction, good design and durability make them the obvious choice – not forgetting the Power drive's anti-click feature. AS

Mould the front page

***JEFF WALKER* kicks off our DTP section with a preview of Gold Disk's Professional Page 2**



"Desktop publishing (DTP) is one of the most exciting and productive uses for your Amiga. *Amiga Shopper*'s coverage of this important area will be unrivalled, bringing you in-depth news and developments as they happen."

JEFF WALKER

Massive programmes take time to suss out properly, so I'll be putting together a full review of *Professional Page* 2 for the first issue of *Amiga Shopper*. Meanwhile here are my first impressions of some of the changes from v1.3x.

I use *PPage* 1.31 to produce a magazine and when v2 arrived I was behind schedule and nervous about changing in case I had to learn everything over again.

On first sight I was disappointed to find there was no list of changes. I would either have to read the 270-page manual (!) or find out for myself.

The first thing to note is that v2 can load documents created with v1.3x, but not vice-versa, because the upgrade handles paragraph indents and changes of style in a different way – v2 has tags.

Tagging along

The addition of tags certainly helps things along. For example, to change paragraph indents in v1.3x you would highlight all the text, set all paragraph indents to one pica then go through and change the few paragraphs that don't need indenting.

But what if you change your mind and want the indent to be two picas instead? The whole process would have to be repeated in v1.3x, but as v2 has paragraph tags, all you need do is change the indent figure from one to two picas. All paragraphs tagged with that particular tag then indent themselves a further pica, leaving everything else alone.

Style tags are another bonus. They hold information about the text's typeface, size, colour, paragraph indent, tracking, baseline shift, kerning, hyphenation, style, line spacing and justification. Once a style tag is set up, just drag a block over the appropriate text and select the style from the Text/Style Tag requester.

Rotation also is new to v2. Both text and graphics can be rotated 360-degrees in one-degree increments. Rotation of CompuGraphic fonts and structured drawings gives perfect results, but bitmap graphics can be subject to severe distortion, except when rotated at 90-degree increments. It's an inherent problem with their low resolution (about 70 x 35 dpi at med-res).

Boons and bugs

Other enhancements include facility to import 24-bit graphics; Pantone colours; automatic page numbering; and the facility to view a double page spread on-screen.

Many of the bugs present in the previous version of *PPage* appear to have been ironed out, but there is a particularly stupid one present that Gurus the program halfway through loading if the year in the system date is greater than 1990. I also found that the menus disappeared when I selected a style tag before any were defined.

Even so, after only three weeks, and despite the bugs, I can see that *PPage* 2 is going to help me produce my magazine more quickly. The date bug I can forgive and the style tag bug I can live with, though I hope Gold Disk fixes it sooner rather than later.

I'll be giving you more details in the full *Professional Page* 2 review in the first issue of *Amiga Shopper*, on sale April 4.

JARGON BUSTING

Baseline: The imaginary line upon which the bases of all letters without descenders sit.

Copy: Text which is ready for setting.

Jaggies: Describes the jagged edges seen on diagonal lines and is caused by the use of small, but nonetheless finite, rectangular pixels used to make up an image.

Pica: A standard unit of type setting measurement, equal to precisely 1/6th of an inch in DTP (approximately in conventional printing).

Tracking: The manipulation of spacing between individual letters. Increasing the tracking pushes letters further apart.



A

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B

BOB WEDS AMY

PRETTY mother-of-11, Mrs Bob, was still in shock last night after her husband of three years divorced her and set up home next door with his computer.

Mrs Bob said in a press conference this morning that she had known about the affair for some time, but thought it was just a **PASSING PHASE** as Mr Bob was going through the male menopause.

But three weeks ago, it has been revealed, Mr Bob had **SECRETLY** filed for divorce on the grounds that he'd gone off her a little bit and understood 68000 machine code more than he understood her. Mr Bob is now in **HIDING** behind locked doors with his new bride Amy and his 11 children — six from a previous marriage to an Amstrad CPC, five by his second wife, Peecy Clone, and the other three by just jilted Mrs Bob.

Sources close to Mr Bob say he very upset that his ex-wife is ing it so hard and that he could eat a pizza today because it minded him so much of Mrs Bob's complexion.

Local social workers are keeping out of the affair after they discovered an Amiga 500 on the head of department's desk. A spokesmoron said: "We are not at all concerned about the welfare of the Bob children. This is not the first time an Amiga has had to bring up 11 kids. I'm sure they'll take to their new mother immediately."

But late last night bangs and screams could be heard escaping from the Bob household, continuing well into the early hours, while an eerie glow permeated a chink in the tightly drawn curtains.

Police were called to the scenie when Mr Bob popped back next door to his old home to ask his ex-wife for a clean shirt. Looking

Continued on Page Two

C

OUT: The old Mrs Bob . . . worried about the children

D

IN: The new Mrs Bob . . . affair had been going on for a while

HORROR!

This page (original size A4) was produced with *Professional Page* 2 and output to a Canon BJ-130 bubble jet printer at 360 x 360 dots per inch. Thanks to the excellent CompuGraphic fonts, there is not a jaggie to be seen. All images were scanned with the Golden Image JS-105-1M hand scanner into *TouchUp*, saved as IFF files and then imported to *PPage*. The whole page took a mere 30 minutes to prepare.

A **The Future Publishing logo was scanned using a hand scanner and then touched up very slightly in *DPaint* before being imported to *PPage*.**

B **All the rules and boxes are structured drawings created within *PPage*.**

C **The woman's face was also scanned in, this time from a colour photo. Black-and-white hand scanners are, on the whole, not very good at scanning photographs, particularly colour ones, but then at under £200 you can't expect the earth.**

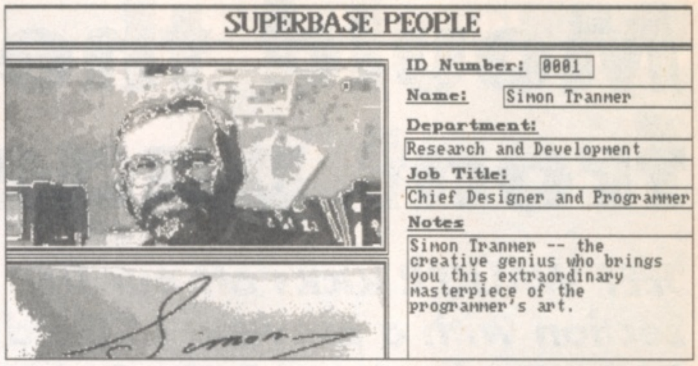
D **This graphic is a combination of clip art and a scanned in black-and-white photograph.The dog in the masthead was also scanned in.**

"Business software is about increasing productivity and, therefore, making money. I run a small business and that makes me sympathetic to your needs. If I wouldn't feel happy using something in my company, I'll say so."

MARK SMIDDY

Down To Business

MARK SMIDDY introduces a regular section focusing on software of which your bank manager would approve



SUPERBASE PERSONAL: A database is not just for mailing lists. You can use one to remind yourself of what you look like.

Serious computer users think the Amiga is a toy. WIMP interfaces, superb graphics and ear-shattering sound are the sort of things these traditionalists baulk at. But tide and times are a-changin'.

So the latest PCs have comparable graphics and WIMP interfaces. People with money to burn can get better sound and multi-tasking systems capable of doing more than one job at a time. Gosh! But the Amiga is already capable of all that and a whole lot more. Moreover, it doesn't cost an arm and a leg to expand the system, so doing the business does not always mean going for broke.

Business software falls into four categories: spreadsheets, databases, word processors and accountancy systems. These divisions cannot be clearly defined as some packages can double as others; many spreadsheets have word-processing and database capabilities, a few databases can do rudimentary accounting and some word processors have built-in database facilities.

A quick word

Word processors are probably the most commonly used business applications. Viewed as a natural progression from the typewriter, they offer freedom to reformat text and reorganise written ideas at the touch of a button. Even rudimentary word processors can help with the production of professional-looking typewritten documents, from letters to complete novels.

Databases are the next step towards the electronic office, though many find their way into people's everyday lives. These systems enable people to organise information and, more to the point, retrieve it quickly and easily. This is best explained by the following classic analogy:

Miss Jones keeps the names, addresses and telephone numbers of her company's clients in a small cardfile. Each record is referenced by the person's surname, so she can locate any telephone number or address in seconds. Then, late one day, the boss bustles in waving a scribbled note. "Miss Jones," he says. "I need to send this letter to everyone in Central London. And it must make the last post!" She will have to look at every single card to check for London addresses. Ouch!

Rapid records

It's easy to see that using traditional methods to organise the same information in several different ways can be nigh on impossible. With a database, Miss Jones could retrieve those addresses in seconds and, if necessary, get the computer to automatically print each letter with the correct address and contact name.

> *"Doing the business does not always mean going for broke"*

Business and accountancy systems deal with such things as wages, stock control, auditing and VAT returns. They are largely the domain of the PC at present, but the Amiga is catching up.

Spreadsheets are one of the most versatile systems yet devised. A good spreadsheet can be made to do just about anything the other systems already described can. However, they are also the most complex to operate. Getting the best from a spreadsheet often involves some knowledge of programming.

Having said all that, the Amiga is not the ideal business machine. But then, neither is the 'industry standard' IBM PC. What gives the PC its advantage is the profusion of available software for it.

> *"The Amiga is not the ideal business machine. But then, neither is the PC"*

Nevertheless, there are now several PC boards available for the Amiga for much less than the cost of a PC clone!

The Amiga's ability to run several applications at once and transfer data between them is another big plus which, in conjunction with the IFF standard, makes the production of impressive graphic presentations simple.

Afore ye go ...

Here's what you can look forward to in *Down To Business* each month. I'll be demonstrating and giving tutorials on how to use specific packages and, for those of you considering a PC for business, I'll be giving the full low-down on Amiga PC emulators. AS

JARGON BUSTING

WIMP: ***Windows Icons Menus Pointer*** **is a graphic interface which saves the computer user from having to enter instructions by key commands. You just move the mouse to point at the desired icon or menu and click.**

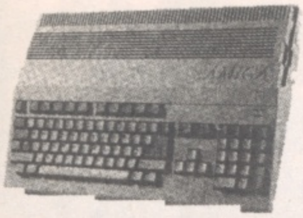
IFF: Interchange File Format is a means by which data from different graphics or sound sampling programs are saved in a compatible way. It allows data to be exchanged between programs very easily and avoids the situation on, say, the PC where dozens of different graphics packages each save data in incompatible formats.

MULTI-TASKING: The ability to have more than one program running on a computer at the same time.

PC: Quite simply, Personal Computer. Used to refer to computers made by, or based on, IBM PCs.

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Presenting PROTEXT 5.0

Five years to the month after Protext version 1 was launched Arnor are pleased to present version 5, an enormous leap forward in both ease of use and performance.

Protext 5.0 introduces a completely integrated system of pull down menus and dialogue boxes. The menus are among the many operations that may now be carried out with either the mouse or the keyboard. Protext really does give you the best of both worlds.

Protext 5.0 handles printer fonts flexibly and accurately. You can make full use of any number of proportional printer fonts, mix them freely within any line, centre them in headers, use automatically formatted footnotes. And Protext correctly formats your text as you type it, no matter how many font changes you use, showing you line and page breaks exactly as they will be printed.

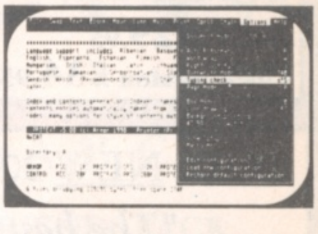
Protext 5.0 is still the fastest word processor around. Even though we have made all these major improvements we have taken great care to ensure that text editing is as fast as ever. The menus work smoothly and quickly even with high resolution displays. But of course, you can use Protext's efficient set of commands and keys just as before and 5.0 remains compatible with all earlier versions from 1.0 onwards.

Protext 5.0 is a worthy successor to version 4, which was described as "the best word processor at any price", "the best text processor on the Amiga" and "the most powerful word processor on the Atari ST" (AUI, ST/Amiga Format, ST User).

Protext 5.0 heralds a new era of multi-lingual European software, in time for 1992 and the opening up of Eastern Europe. Protext may be used in at least 27 different languages and has 10 different national keyboard layouts built in (plus the capability to define your own symbols and keyboard layouts).



The Features



- **New fast & easy to use pull down menu system** with dialogue boxes and alerts; file selector; mouse dragging to set blocks. Menus complement existing commands and keyboard shortcuts, do not replace them. Menus may be used with mouse or keyboard. Amiga version follows Intuition guidelines.
- **Enhanced printing capabilities** supports multiple proportional fonts; mixing of different font sizes on the same line; proportional formatting whilst editing; side margin, headers and footers independent of main text font. Tabs, decimal tabs and centre tabs. Extensive range of printer drivers supplied.
- **Multiple file editing** - up to 36 files may be open; split screen editing.
- **Graphics mode support** on PC allows use in virtually any text or graphics mode including 132 column or 75 line VGA modes; user defined characters and on-screen bold, italics and underlining now on all versions; use of 13 different accents on any character.
- **Language support includes** Albanian, Basque, Czech, Danish, Dutch, English, Esperanto, Estonian, Flemish, Finnish, French, German, Hungarian, Irish, Italian, Latin, Lithuanian, Norwegian, Polish, Portuguese, Rumanian, Serbocroatian, Slovak, Spanish, Slovene, Swedish, Welsh. (Note: some printers do not support all languages).
- **Index and contents** generation. Indexer takes marked words or phrases; contents entries automatically taken from titles wrapped in control codes; many options for style of contents output.
- **Spelling checker** features completely new 110,000+ word Collins dictionary with very fast phonetic lookup. Anagrams and find word pattern. Foreign language dictionaries (German, Swedish available now, others to follow).
- **Many other enhancements** including multi-line footnotes and endnotes; automatic timed save; add column or row of figures; indent tabs; find word at cursor; 40 column mode support; sentence operations; inter- paragraph space; much improved expression evaluator; self incrementing variables; Roman numerals; newspaper-style column printing; file sorting utility with special options for names and addresses; revised manual plus new tutorial guide.
- **And don't forget Protext still includes** background printing; box manipulation; macro recording; exec files; headers and footers; find and replace; mail merging; undelete; file conversion utility; configuration program; auto reformatting; on screen help; time and date; typewriter mode; line drawing; disc utilities.

Prices

Protext 5.0 may be purchased from any good computer shop or directly from Arnor. Upgrades from earlier versions are only available from Arnor and the original discs should be returned with your order.

	PC	Amiga	ST/TT	Archimedes
Protext 5.0	£149.95	£149.95	£149.95	£149.95
Upgrade from v4.2	£60	£60	£60	N/A
from earlier versions	£75	£75	£75	N/A
Protext 4.2	£99.95	£99.95	£99.95	N/A
Prodata 1.1	£79.95	£79.95	£79.95	due 1991 Q1

Notes:

Protext 5.0 requires at least 640K of memory on all machines
Protext 4.2 requires at least 512K of memory on all machines
Prodata requires 1MB of memory on the Amiga

ARNOR

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"When it comes to graphics, the Amiga always turns up the overall winner in its class. In the coming months I'll be looking at every aspect of Amiga graphics covering news, reviews and tips using the best Amiga graphics packages".

PHIL SOUTH

Get the picture

PHIL SOUTH starts off our regular graphics column with his first impressions of Disney Software's Animation Studio

Disney has a special place in the history of animation. No other man or company has contributed so much towards cartoons, animation and entertainment as Disney. Thus it is only fitting that the best animation company and the Amiga, the best graphics computer, should be brought together with a piece of software aimed at the production of animated cartoons.

"Some of the useful example animations are actually scanned pencil tests from Disney cartoons"

There are three disks inside *Animation Studio*'s huge box. The Studio disk contains the program, a library of sample animations and some basic sound effects. The Morgue disk contains reference animations from Disney's studios and are provided for study, meaning you can't use the characters as your own. The Demo Reel disk contains a black-and-white animation and a full colour one that features Donald Duck, plus an additional animation with colour and sound.

Using the Program

At least 512K is needed though as usual one Megabyte or more is recommended. Once up and running, a screen appears which very closely resembles that of *Deluxe Paint* 3 in its animation mode except that there are no colours to be selected. This is the Pencil Test phase of the program, enabling you to create your animation cels and 'pencil test' them. It's a computerised version of the process used by professional animators and allows you to 'see through' the top cels on your screen to the cels below. They are displayed as dark grey, light grey and even lighter grey, giving the impression of a series of drawings on stacked sheets of translucent paper. This excellent facility helps you register your images extremely accurately.

Tooling up

The tools are mainly for creating simple objects, filling text, clipping brushes and filling. There is also a magnify mode and 'insert/delete frames' buttons down the side of the screen, plus the option to animate your pencil test at different speeds and save it to disk in one of three different formats – standard IFF format for single frames; ANIM format, which is the IFF animation standard; and the special, compressed *Animation Studio* format, CFAST. From the Pencil Test and the similar Ink & Paint screen animation sheets can be created detailing precise timings, cel numbers and descriptions and then printed out.

One of the most interesting features of *Animation Studio* is the examples included. They have been produced by a gaggle of famous Disney animators and some are actually scanned pencil tests from Disney cartoons. Most of the examples given are useful and, though they cannot be used in your own animations legally, they provide useful tutorial material. Many tricks of the trade are described here: arcs of motion; two and four-legged walks; anticipation; flight; path of action; squash; and stretch.

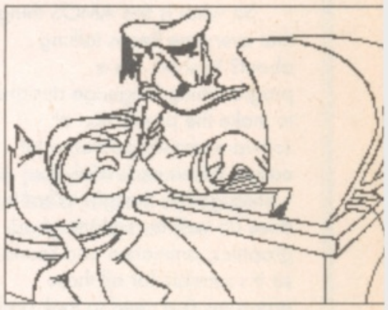
"One glaring omission is the facility to send cels to a plotter"

The editing facilities of *Animation Studio*, while very good, are not nearly as precise or easy to use as those of, for example, *Deluxe Paint* 3. Even so, through use of the program it becomes clear that *Animation Studio* was designed by and for professional animators. However, the one glaring omission, and something that could quite easily have been included, is any facility to send cels to a plotter thus making it impossible for animated sequences created in the program to be made into real cels in a professional environment.

It's a wrap!

Despite the omission of printing utilities, *Animation Studio* is still an excellent animation program. The pencil-test facilities are simply unrivalled and serve to put it a jump ahead of the competition.

The wealth of tools, particularly Camera Frisket and the ability to change palettes between frames, makes it quite easy to produce a number of professional-looking animation effects. I'll be giving you in-depth info and a tutorial for *Animation Studio* in issue 1 of *Amiga Shopper*, on sale April 4. AS



Donald gets to grips with his maker in one of the package's brilliant animation sequences

JARGON BUSTING

CEL: One piece of animation artwork. Derived from the word celluloid, a sheet of clear plastic (acetate) on which individual frames or characters are painted in traditional animation.

FRISKET: A tacky, transparent film used for masking areas that are to remain free from any drawing or painting.

PENCIL TEST: The initial working out of an animation sequence using layers of tracing paper and a pencil.

> "In this column I'll be reviewing programs written in AMOS and submitted to various PD libraries. I'll also be giving you loads of hints and tips to help you get the most from this terrifically powerful programming language."
>
> PHIL SOUTH

AMOS action

PHIL SOUTH gets famous with AMOS and analyses some new PD games written with Mandarin's Basic interpreter

Here is the first in a series of AMOS tutorials and reviews based around the AMOS Basic interpreter by Mandarin Software.

So what is this AMOS thing that everyone keeps talking about? In short, it's a programming language designed to make the production of software, mostly games, a lot easier. It isn't exclusively for writing games though. What it does do well is combine good graphics, animation and sound, so it's suitable for all those programs that need to look and sound particularly special.

Before you start worrying that this is the thin end of the wedge and just an excuse to get games into *AS*, be assured that what we are interested in is the programming side of things, because we know that's what you want to hear about.

If you have not encountered AMOS before, be warned that although it can do some spectacular things it cannot turn you into a programming whizz overnight. Like any other programming language you will have to put in a lot of effort to start with in order to learn it and get the best out of it. But it does make the production of professional looking software much easier than having to use C or assembly language.

Better and better

AMOS is also a program you can expect to see continually updated and improved. As well as updates to the main program itself there are extras disks available. Currently there is a sprites disk and other releases due this year include the imminent AMOS Compiler, which will speed up AMOS programs still further, and AMOS 3D, which will help you to create filled 3D graphics programs.

If you have not got a copy of AMOS, but think it sounds like the software for you, then contact the supplier, Mandarin Software ☎ 0625 878888, which will sell you one for £49.95. Then keep your eyes peeled for this column every month and we will tell you how to get the best out of your new acquisition. To start this regular column off, here are some analyses of a few new games written by Robin Edwards of PD Soft distribution. PD Soft specialises in games written in AMOS and, although you can certainly write more powerful applications, all PD Soft's products give you an awful lot to go on as to some of the things that can be accomplished in the games arena.

As well as being fun to play, they are quite well written and a study of the listings can only improve your understanding of the language. Of course it might also make you blind, but is that my fault? In any case, that's enough wibbling from me.

LAUGH LINES

We are on the lookout for cartoonists who can do two things (if not more) – One, draw good cartoons or a strip on conventional media or the Amiga. Two, make them funny. The second part is the most important and the most difficult – if it doesn't make us at least chuckle it simply will not do. And we'll even pay you for them, so earn some dosh by sending your cartoons to: Funnier Than Bob's Ears, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

Space Blob
(PD Soft L002)

Gameplay in Robin's first offering is a game in which, not unlike *Jet Set Willy*, you have to jump platforms to collect rainbow-coloured items. As the screens become progressively more difficult, there appear greater obstacles to leap over and yet more baddies to avoid.

One snazzy bit of code is where the hero of the game hits an obstacle or baddie. Cleverly, Robin has animated the death so the hero fades away:

```
7000 Rem ——— DIE ———
 Pop
 If Inkey$="h" Then Inc
SCRN : Clear Key : Goto
110
 Move Off(1) : Dec LIVES :
Boom
 Anim
1,"(36,7)(37,7)(38,7)(39,7
)(40,7)(41,7)(54,10)" :
Anim On:
Wait 52
```

POP goes the sub

The POP command allows you to nip out of the Gosub that sent you there. The MOVE OFF part stops the action and all the baddies halt in their tracks. DEC LIVES knocks one off your lives' variable and BOOM is the sound effect; a slow, white-noise explosion. Finally, the animation fades you out with ANIM. Clever stuff, and it looks nice on-screen.

Even so, of the games produced by PD Soft, this is the least original. The design is not bad considering it was written, according to the message at the beginning, in a very short time. The speed of the sprites is a little fast, which impairs control of the Space Blob. Despite this being the least interesting game from this author, playability is still great.

Mr Dig
(PD Soft L001)

Ever wanted to dig yourself a great big hole in the ground? Well here's your chance.

The game, called *Mr Dig*, is a kind of *Boulder Dash* clone. In fact it is based more closely on the famous (if you were playing games in the Dark Ages that is) *Dig Dug* arcade game.

Big scrolly wad

It is the biggest program in the PD SOFT range and makes quite a thick wad of paper when printed out I can tell you. One of the nice features built in is the scrolly message on the title screen, done with the following code:

```
A$="welcome to the amiga
version of mr dig."
```

Then, after a load more message:

```
A$=A$+"Z"
Auto View Off
 Screen Open
2,400,32,8,Lowres : Cls 0
 Curs Off : Flash Off
 Screen Display
2,96,255,400,32 : Screen 2
: Auto View On
 Palette
$0,$600,$800,$A20,$A40,$C6
0,$C80,$EA0
 Def Scroll 1,0,0 To
400,32,-4,0
  II=0
 Repeat
  Inc MCHR :
Z=Asc(Mid$(A$,MCHR,1))-19
  If Z=71 Then MCHR=0 :
Z=13
  If Z=27 Then Z=104
  If Z=25 Then Z=105
  If Z=14 Then Z=106
  If Z=44 Then Z=107
  For I=1 To 8
    Scroll 1 : Wait Vbl
    If Fire(1) Then II=1
  Next I
  If Z<>13 Then Paste Bob
364,0,Z
 Until II=1
```

This 'reads in' the message, stored in the A$ lines above it, onto the screen at the bottom letter by letter and scrolls it across the screen. When the message

runs out, another segment is read in and scrolled across behind it. This is clever stuff, though you can see a slight judder when the messages change over.

Mr Dig is an interesting variant of a popular game and very professionally written.

We are not a muso

The design is excellent and the use of AMOS is first-class. The only real reservation I have is the use throughout of standard default tunes as supplied with the AMOS package. Couldn't Mr Edwards have got a copy of *Soundtracker* or *Noisetracker* and composed some tunes himself?

He could have got someone who was better at the music side of things to write one for him, but ... ah well, we're none of us perfect eh? Other than that, it is still an excellent AMOS game.

Q-Boid

(PD Soft L003)

This program is an interesting variation on *Tetris*. It features a new slant whereby you have to fill up the shapes using bullets from your spaceship before they reach the bottom of the screen. The design isn't flawless, but play is very addictive. As with the other disks, the music is standard default tunes from the AMOS disks.

Primal screen

It's a very tasty bit of coding too. One feature that caught my eye was the way Robin has stored the setups of the blocks for each screen:

```
20000
 Data "     ggggg          "
 Data "   bbbghh iii       "
 Data "   baaaah i iff     "
 Data "   ba  aheeeeef     "
 Data "         hzzzz f    "
 Data "        cccccz f    "
 Data "     ddddd c  f     "
 Data "         d          "
 Data "                    "
 Data "                    "
```

Each line of data is read in, having first tested for the right screen. The data for the correct screen is read in line by line and then each character is tested and turned into one of the 3D blocks. Classic data storage technique demonstrated there.

Q-Boid plays quite rapidly, showing off Mr Edwards' grasp of AMOS yet again, and a lot of useful tricks and tips can be found by looking up his listings. (Ooh no missus. Put those listings away!)

It is a very simple and effective idea and a novel twist on the original. The design and play have been very well thought through and the game deserves high praise for its addictive qualities. AS

For all PD Soft Distribution products contact: PD Soft Distribution, 1 Bryant Avenue, Southend on Sea, Essex, SS1 2YD.
☎ (0702) 466933/612259
Many thanks are due to Robin Edwards for supplying such high quality material for our first AMOS Column.

AMOS TIPS

Every month I will be printing hints and tips on AMOS from my own sources and from you the readers. If you have any hints and tips (preferably accompanied by mini listings) you want to send me, whack them on paper or a disk and send them to: Phil South, AMOS Column, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon, BA1 2AP.

Snouty roots for tips

Each and every month, Phil 'Snouty' South aims to root out those tasty little truffles that will give your AMOS recipes spice. For starters, take a look at his four handy hints below and prepare to make yourself equally famous with AMOS.

The Devil in *Q-Boid*

LOCATE can be a tricky little devil, but it is one of the most powerful print format commands available.

Here is an example of how to use LOCATE from PD Soft's *Q-Boid* program:

```
Cls 0,20,124 To 171,147+8
Box 20,124 To 171,147+8
Locate 7,16 : Print "Well Done!"
Locate 3,17 : Print "You have completed"
Locate 9,18 : Print "Q-Boid."
```

This inserts a panel into the final game screen to tell you that you have won the game and is so much more fun than fiddling around with print statement colours. Mind you, so are most things.

Keep 'em small

Create small programs to do each job in your program then merge them together to make bigger programs. This makes life a lot easier as you can test discrete bits of the program one at a time and then bolt them together with a fair degree of certainty that the finished program will work. In fact this is a very good way to build up your programs.

Prepare a brief description of what you want each element of your program to do, ie: one routine to do the hi-score table, one for displaying the title screen, one for changing the music, etc. Then, once you have it all laid out on paper, you can set to work programming each little segment, or module if you prefer, one by one.

This breaks the problem down into smaller bits and gives you more of a grip on what it is you are doing. Diving in to code a huge game or other program in AMOS in one swell foop is a short route to the funny farm. Just try keeping forty different variables in your head at once and you will begin to see the logic of working more methodically.

Keep 'em neat

At all times use good programming style. That is to say keep your program in order. Don't just bolt extra bits on as you need them. Plan each step carefully and make sure you have it all down on paper before you touch the computer. Make your self-contained bits of code so you can just tack a RETURN onto the end and run them from a main program routine, thus:

```
main:
ONE
TWO
THREE
Print "done it all"
End
'
Procedure ONE
    Print "one"
End Proc
'
Procedure TWO
    Print "one"
End Proc
'
Procedure THREE
    Print "one"
End Proc
```

This way you can just add a new bit by merging the code from a new subroutine and altering the control part of the program. Add:

```
Procedure FOUR
    Print "one"
End Proc
```

and put the line:

```
FOUR
```

after the bit that says THREE in the main part of the program, and there it is!

Crafty copper

And finally for all you copper bar fans, here's a nice simple background for your scrolly demos. Type the following segment into your next program:

```
Set Rainbow 0,1,30,"(1,1,15)(1,-
1,15)","",""
Rainbow 0,0,49,212
```

and before you know it, you'll have coppers coming out of your ears.

Who the hell do we think we are?



BOB WADE



KARL FOSTER



CLIFF RAMSHAW



JEFF WALKER



PHIL SOUTH



MARK SMIDDY

TEAM PROFILES

Who is this bunch that is bringing you the only serious Amiga magazine you will ever need? We thought you might like to know a bit about us, and even if you don't we're still going to tell you. We got all the team members to jot down their own short biographies, then the Editor got hold of them and produced the complete and utter pack of lies you see here.

BOB WADE – Editor

Bob Wade is a retired game player who, when he isn't spending 25 hours a day editing magazines, spends most of his time in local hostelries discussing American football, good 'ole British football, trivia quizzes, whose round it is next, admiring the remarkable number of wonderful ladies there are in Bath (their minds, that is), listening to late-Seventies' music on the jukebox, playing poker and completely avoiding the subject of magazines.

KARL FOSTER – Production Editor

Karl Foster is a man of few words – beer, food and sleep being three of his favourites. He left a career in local newspapers to join *Amiga Shopper* in a bid to avoid having to cover any more parish council meetings. We haven't told him he's our user group correspondent yet.

CLIFF RAMSHAW – Technical Editor

Cliff Ramshaw is the sort of person who, when asked, finds it difficult to say much about himself. But when severely cattle-prodded, he will admit to have written several games programs for the VIC 20. Appropriately enough, he has since moved on to writing fiction and tends to turn out lots of stuff about artificially intelligent computers developing mental problems. He's been totally engrossed in conversation with the office Amiga ever since he arrived.

JEFF WALKER – Consultant Editor

Distressed at being locked away in a boarding school during the Swinging Sixties, Jeff tuned in, turned on and dropped out to the groovy sounds of the Shocking Seventies.

After 10 years of writing anything for anyone who would publish him, he launched his own Amstrad CPC computer fanzine. After 18 months he was rescued by a proper publishing house and put to work on proper magazines, one of which was Amiga specific.

The reported imminent revival of flared trousers early in 1990 got all the old anti-establishment juices flowing again and he was forced to resign, grow his beard and go back to his roots in desktop publishing.

Using the Amiga and a selection of DTP software he has, since late 1990, been having terrific fun publishing an Amiga-specific fanzine.

PHIL SOUTH – Consultant Editor

Phil South is a freelance writer, musician and programming expert who went freelance to get out of the rat race. Unfortunately, he's since discovered that the freelance rat race is even bigger.

MARK SMIDDY – Consultant Editor

Mark Smiddy typifies the self-made man. The sort that comes in kits where some of the parts are missing.

At 28 he has co-authored two books on the Amiga, written more articles than he cares to remember and devised several computer games he prefers to forget. Born in Cornwall, he now resides in rural Cleveland, sandwiched between the seaside and one of the largest chemical factories in Europe – the sort of place where men are men, women are women and sheep glow in the dark. AS

SO WHAT'S THE STORY?

If you have a news story that all Amiga owners ought to know about, make sure you tell us about it, because if you don't tell us then we can't tell everyone else. What's newsworthy? Well, how about new hardware, new software, shows, services, overseas markets, Amigas in odd places, unusual uses for the Amiga, famous Amiga users, major achievements and disasters caused by the Amiga, bankruptcies, new companies and anything else you think would be of relevance or interest to Amiga owners. Write to: Shock Horror Probe, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW or FAX us on 0225 446019.

WHO ARE YOU?

So what do you use your Amiga for? Don't be shy, we would like to know. If you are using it in a professional capacity, as part of an interesting hobby or in some unusual capacity then why not tell everyone else about it – it could be the start of something big. You can either write your own self-profile or we might be persuaded to drop in on you and have a chat ourselves. We are particularly interested in profiles that will give other Amiga owners bright ideas for things they too can do. Send your words to: I Want to be Famous, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

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Send your padded envelopes to Jeff Walker, ABC of Programming, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW.

JEFF WALKER

The ABC of programming

JEFF WALKER conducts a quick tour of Assembly, Basic and C

Programming languages abound, but Amiga users tend to stick with three: assembly, Basic and C. These are the ones I'll be concentrating on in a series of tutorial articles over periods ranging from two to six months.

Parlez vous FORTRAN?

Why are there so many computer programming languages? There are hundreds of the damn things, all with weird and wonderful names like LOLITA, TREET, FLAP and BASEBALL. There's even one called MADCAP. Why not just have a single language?

Back in the early 1960s it was far simpler. For scientific programs you used FORTRAN; for business programs you used COBOL. That is, unless you lived outside America, in which case you used the newfangled ALGOL 60. Then someone combined the best features of all three and christened it Programming Language One. But its very name presupposed there would be a Programming Language Two, so by the end of the decade every Tom, Dick and IBM was working on writing the definitive programming language.

Two Dartmouth College professors threw FORTRAN into the pot and cooked up the easy-to-learn language, Basic – destined to become enormously popular as the grass roots language of the 1970s microcomputer revolution.

Boffins at Cambridge University tarted up ALGOL 60 and called it BCPL, then the American Telephone & Telegraph Co developed it into a language called B. Later, in 1972, AT&T developed it further into a language called C. It was meant purely as an in-house language to be used at the company's Bell Lab-oratories, but when someone started to use it to write a new operating system, UNIX, – a type of program traditionally written in low-level assembly language for speed – C found its true purpose.

> *"The reason why there are so many programming languages is the same reason you would phone a plumber when your pipes burst"*

So the reason there are so many programming languages is the same reason you would phone a plumber when your pipes burst, or an electrician for your wiring – each is a specialist, invented to do a particular job or range of jobs.

Over the years, C has proved to be the nearest thing there is to an all-purpose, high-level language. If it can be written, it can be written in C. It allows you to do things that are impossible in other languages and lets you express ideas concisely. It is this very conciseness which frightens a lot of people off. Yet C has become popular simply because programmers like it, which is probably because C gives access to any level of the computer, right down to raw machine code.

The most popular C compilers for the Amiga are *SAS/C* and *Manx* – both pretty pricey – but Matt Dillon's up-and-coming *DICE* looks to be a serious rival at a fraction of the price.

Faster than C

As quick as the language is, a program written in C can never run as fast as the same program written as efficiently in pure assembly language. Also called machine code, assembly is the lowest level at which you can program a computer – the nuts and bolts level where you can get your hands really dirty.

Every program ever written, in any language, is converted either by an interpreter or a compiler into machine code instructions. At this level of programming you have to tell the computer exactly what to do at every step.

For instance, in Basic, and to some extent in C, it might be possible to have a single instruction to fill a bucket with water. But in assembly you would have to design the bucket, build the bucket, design the tap, build the tap, design the water, build the water, move the bucket underneath the tap, turn on the tap, stipulate the rate and direction of flow, keep checking the level of water in the bucket until it is full, at which point you turn off the tap. The difference between assembly and Basic is that in assembly you know you have got the exact bucket of water you asked for.

There are several popular machine code assemblers for the Amiga and in my tutorials I shall, where possible, tell you if instructions in my example source codes need to be changed to work with your assembler. Anything that needs great speed is best programmed in assembly, but it will always be easier to program the same thing in C.

Ease of use is Basic's forte but, to be bluntly honest, nothing is best programmed in it. However, it does provide a handy stepping stone to more structured languages like Pascal, Modula-2 and C. But be warned; the transition from Basic to assembly language isn't so smooth. Basic on other home computers means sloooow. Not so on the Amiga. AmigaBasic is about as speedy as an arthritic rock (and about as solid), but there are compilers that can make Basic programs run almost as fast as C programs. The two most popular are *GFA-BASIC* – which also has an interpreter – and HiSoft's *Basic Compiler*, which is about 95 per cent compatible with AmigaBasic. *Amiga Shopper* will feature articles and series dedicated to both these popular compilers, but because of the differences between them, I'll be unable to give instructions for converting between the two. AS

> *"The difference between assembly and Basic is that with assembly you know you've got the exact bucket of water you asked for"*

Software for free

"I'll be looking at all the very best Amiga PD and shareware software, following up every lead on what's available from bulletin boards and from all the best PD software libraries. In short, I'll be reviewing a huge range of PD interests."
PHIL SOUTH

PHIL SOUTH enters the Public Domain to bring you the full lowdown on all the very best in PD-ware and shareware

Free lunch? Could there be such a thing? Yes indeedy. Ever since computers arrived, enterprising programmers have placed programs into the public domain. Either through some sense of altruism, or just because they couldn't be bothered to market the programs, they have freely distributed their efforts. This is great news for the rest of us. Few computers, other than the IBM PC, have as much PD software as the Amiga and the amount is growing daily

Amiga Shopper aims to provide the mostest when it comes to PD. To kick us off this month here are two very different and interesting items that were downloaded from the CIX bulletin board – an on-line conferencing system based in London.

JARGON BUSTING

CONFERENCING SYSTEM: A telephone-based system in which users can send and retrieve messages, via modem, to and from a public database.

INTERLACE FLICKER: Interlace is a method used to double the apparent vertical resolution of the monitor by alternately refreshing the screen at a slight offset. The screen is therefore effectively refreshed at half the normal rate, hence the flicker.

LHARC: Is the name of just one of many programs used to compress a number of connected programs into a file for quick transfer between users. Typically, a file archived thus takes up less space than the sum of its decompressed programs.

SHAREWARE: Describes software distributed for free whereby the user is obliged to either send money to the author if he or she wishes to keep it or destroy the copy.

ANTIFLIK.LZH

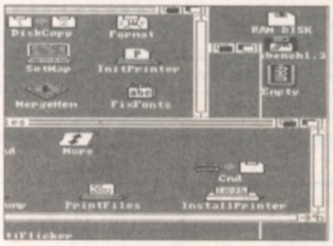
This file is readily available on a great many bulletin boards in the UK. The .LZH on the end of the file indicates it's a compressed file, or 'archive' which contains a number of other files. The compression program is LHARC.

Antiflicker is an attempt to overcome the interlace flicker of the Amiga's hi-resolution, 640 x 512-pixel display mode by using a software trick to de-interlace the display, making the boundaries around letters and edges on the screen appear slightly fuzzy.

To install *Antiflicker* on your own hard or floppy disk, copy the program to your C directory and add one of the following lines to your startup sequence:

```
runback c:antiflicker
```
or
```
runback c:antiflicker-c
```

Then set your preferences to interlace mode and re-boot. The drawback of using *Antiflicker* on your Workbench is that the Topaz 8 font is unreadable. In most



See above just how clear the display is with *Antiflicker*! Hm.

cases you should use bigger fonts like Topaz 10 or 11. The -c parameter renders a four-colour Workbench as normal, but a single bitplane (or black-and-white) Workbench use the syntax:

```
run antiflicker
```

To turn off the program, run it again using the exact command used to turn it on; if you used antiflicker -c, then you must use antiflicker -c to turn it off. Colours cannot be changed when *Antiflicker* is running.

Antiflicker does not affect programs opened using their own custom screens, but it will affect those opened on the Workbench screen using default colours and interlace. The documentation says that the best colours to use as preferences are medium-grey for colour 0, black for colour 2 and dark red for colour 3.

Conclusion

Antiflicker is one solution to interlace flicker. However, it's certainly not the *final* solution. The only way to truly get rid of interlace flicker is to invest in some kind of display enhancer (like the one due from Commodore, if it ever becomes available!) or a flicker fixer and a VGA/Multisync monitor. But for certain applications, especially where a lot of text is on the screen, *Antiflicker* is a not a bad solution to the problem.

VALUE FOR MONEY 89/100

This is a clever piece of coding and performs well considering it is trying to do something that is virtually impossible

PHONE.LZH

This program was also downloaded from the CIX bulletin board and similarly compressed by LHARC. A command is typed at the CLI prompt:

```
phone
```

After the word 'phone', type in a telephone number as the parameter, eg:

```
phone 0225-442244
```

and when you press return, the two speakers of your Amiga monitor will produce touch-tone telephone sounds. Wow!

This is an interesting way of producing an automatic dialler using AmigaDOS batch-file commands. You could, for instance, create a directory listing a series of useful telephone numbers, select one and dial the tones over the monitor speakers into the mouthpiece of your telephone. Why on Earth you would want to do that is another matter entirely.

Clearly the use of this program is somewhat limited, but it's a very neat and interesting way of producing telephone tones for whatever reason.

The source code was not supplied in my version, but I understand that in others there is some kind of interface and the code is there for you to adapt.

Conclusion

While not a comprehensive autodialler, *Phone* is a simple and effective way of getting telephone tones from your computer. If you need these (and let's face it, who does?) it could be a useful addition to your C directory. AS

VALUE FOR MONEY 46/100

***Phone* is useful, but it's not *that* useful. Fun is more the word I would use. Musicians and possibly TV-types might like to use it to generate touch tones as a special effect.**

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Issue 1 of *Amiga Shopper* is on sale on April 4, so don't miss out – it will not be on the shelves for long. Inside it you will find the most comprehensive guide ever to hard disk drives, a hardware project showing you how to fit your own anti-click drive device, full review/tutorials on *Professional Page* 2 and the *Disney Animation Studio* (and we mean FULL reviews), plus all the regular columns and a few extra surprises besides. You will be getting more than 116 pages containing more than 75,000 useful and informative words (formed into useful and informative sentences). All this for only 99p. Make sure you reserve your copy today.

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ADVERTISING INDEX

ISSUE ONE ON SALE APRIL 4

HiSoft News

All the latest news and product information.

ProFlight takes off!

ProFlight, the extremely accurate and flyable Tornado flight simulator from HiSoft, is due for release on the Amiga by the end of May 1991.



First released on the Atari ST where it has won a high degree of critical acclaim from reviewers and users alike, ProFlight is not only one of the most technically realistic simulators around but it is also tremendous fun to fly.

You can fly peaceful reconnaissance missions or roar into attack after carefully planning your combat mission. ProFlight is supplied with a comprehensive, ring-bound flight manual for an all-inclusive price of £39.95.

Pascal at last!

HighSpeed Pascal

A brand-new version of the popular Pascal language will be available soon for the Amiga (A500 - A3000).

HighSpeed Pascal originally comes from Denmark, (the 'home' of Turbo Pascal), is extremely fast and friendly to use and is very closely compatible to the immensely popular Turbo Pascal on the PC.

Compilation speed is roughly 20,000 lines per minute on an A500 with excellent code generation for all the Amiga computers.

HiSoft is developing the package along with the original authors, D-House. Some of the features of this exciting new compiler are:

- Compile to memory or disk
- Unit concept as in TP5 allowing modular development and very fast compilation. Many standard Amiga-specific and Turbo Pascal compatible units are supplied
- Stand-alone compiler supplied. Multi-standard linker. Versatile Make facility
- Source include to a depth of 7
- Inline procedures. Source code control using conditional compilation

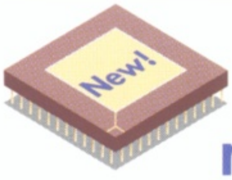


The HighSpeed Pascal Editor

- Integrated, multi-window editor with on-line help and interactive error detection and correction
- Numerous examples and helpful manual

HighSpeed Pascal should be available by the end of May 1991 at an inclusive cost of £99.95.

More and more...



In addition to ProFlight and HighSpeed Pascal HiSoft is set to release a number of other new products for the Amiga in early 1991, showing our increasing committment to the Amiga range of computers. To whet your appetite:

HiSoft C Interpreter

The ideal way to learn the difficult C language, HiSoft C is an interpreter with a fully integrated editor and debugger. Release is due by the end of June 1991 at a price of £49.95.

HiSoft Inspiration

This exciting new product makes it simple to design and use the Amiga's gadgets, requesters etc. in your favourite programming language. Release date is the end of March 1991.

Devpac and BASIC

HiSoft Devpac version 3 and HiSoft BASIC version 2 are due out in the first half of 1991. Both feature a brand new, multi-window editor, much more speed and a great many new features. Tick the box(es) below for details.

Meanwhile, we have some very special offers on our existing products - use the order form below (you can photocopy it if you wish). Devpac 2 and BASIC 1.05 contain coupons offering you the chance to upgrade to Devpac 3 or BASIC 2 for £35 and £45 respectively.

SAS C5

SAS Institute (the parent company of Lattice Inc.) has taken over the development and sales of the Lattice C 5 compiler for the Amiga and released a new version, 5.10a.

The improvements and enhancements in this version establish SAS C5 as the ultimate Amiga C compiler. Upgrades cost £34.95 (ver. 5.0x), £79 (ver. 4.xx) or £99 (ver. 3.xx).

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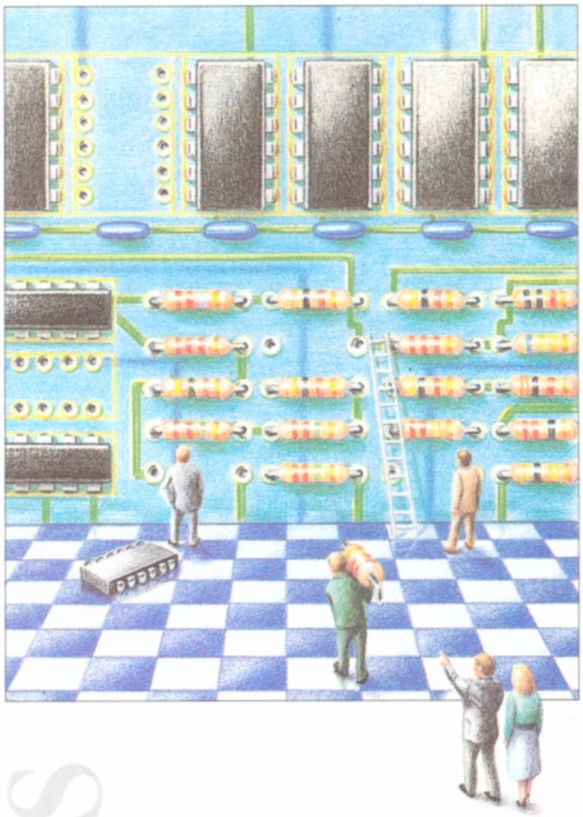
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